

NAVAL STATION MAYPORT POLLUTION PREVENTION PLAN

This Pollution Prevention Plan (P2 plan) presents Naval Station (NS) Mayport's pollution prevention policy; the P2 plan's applicability and scope (including P2 goals); NS Mayport installation information; management and administrative elements; planned process-specific improvements; P2 priorities; installation-specific potential barriers to P2; other requirements; and the Commanding Officer's statement and approval. This plan was prepared in accordance with Navy guidance presented in the Navy Shore Installation Pollution Prevention Planning Guide (Navy 1994b). Other references used to prepare this plan are listed at the end of the documents.

SECTION 1

PURPOSE

This NS Mayport P2 plan (1) identifies measures and procedures that NS Mayport has undertaken to comply with U.S. Department of Defense (DoD), U.S. Department of Navy (Navy), federal and state directives, standards, and regulations regarding P2; (2) identifies major installation processes that use toxic chemicals or generate hazardous wastes that are transferred off site; and (3) presents technically and economically feasible options for reducing toxic chemical releases and hazardous waste generation. Standards, memoranda, regulations, and documents relevant to this P2 plan are summarized in Table 1.1 in chronological order.

This P2 plan describes existing and planned components of the NS Mayport P2 Program. The program includes management and administrative elements and process-related improvements. Also included is a plan of action and milestones (POA&M) for achieving P2 goals through February 1996.

NS Mayport already has various systems in place to ensure that hazardous materials and hazardous wastes are managed properly and in accordance with local, state, and federal permits, regulations, and goals. NS Mayport's P2 plan builds on the installation's previous and ongoing environmental management, hazardous waste minimization, and P2 efforts and establishes a comprehensive framework for achieving P2 goals established by the August 3, 1993, Executive Order (EO) 12856 and the August 11, 1994, DoD Comprehensive P2 Strategy Memorandum (CPSM) responding to EO 12856 (DoD 1994).

Two specific purposes of this plan related to these directives are to (1) identify and document installation HMs and hazardous wastes resulting in emissions to the environment or off-site transfers of waste and (2) present technically and economically feasible options to reduce such emissions and wastes to the maximum extent feasible. Navy-wide P2 goals are summarized in Table 1.2. P2 goals and milestones specific to NS Mayport are discussed in Section 3 of this plan.

TABLE 1.1
DOCUMENTS AND REQUIREMENTS RELEVANT TO NS MAYPORT
P2 PLAN

Title/Reference	Date	Relevance
Executive Order (EO) 12088, Federal Compliance with Pollution Control Standards	October 13, 1978	Requires federal agencies to take actions necessary to comply with applicable pollution control standards
Secretary of the Navy (SECNAV) Memorandum	April 29, 1988	Instructs Chief of Naval Operations (CNO) to ensure that adequate resources are available to successfully implement a hazardous waste minimization (HAZMIN) program
OPNAVNOT 5090 Ser 451/8US584639	May 19, 1988	Establishes the Navy HAZMIN program and sets a uniform Navy policy on HAZMIN
DoD Directive 4210.15, Hazardous Material (HM) P2	July 27, 1989	Establishes policy, assigns responsibilities, and proscribes procedures for HM P2 and requires Navy to develop, revise, and implement an overall HM P2 plan
OPNAVINST 4110.2, Hazardous Material Control and Management (HMC&M)	June 20, 1989	Establishes uniform policy, guidance, and requirements for life-cycle control and total quality management of HMs acquired and used by Navy; also contains Navy's current P2 plan
Pollution Prevention Act	1990	Defines P2 as source reduction and establishes a national policy stating that P2 is the most-preferred approach for environmental protection; states that recycling, treatment, and finally, disposal should be considered after feasible P2 opportunities are evaluated and implemented
OPNAVINST 5090.1A, Environmental and Natural Resources Program Manual	October 1990	Requires all Navy facilities to write a HAZMIN plan certifying that they have a waste reduction plan in place if they sign a waste disposal manifest and prepare solid waste management plans (SWMP)
Facility Pollution Prevention Guide	May 1992	Navy P2 planning process generally follows processes outlined in this U.S. Environmental Protection Agency (EPA) guidance document

TABLE 1.1 (Continued)
DOCUMENTS AND REQUIREMENTS RELEVANT TO NS MAYPORT
P2 PLAN

Title/Reference	Date	Relevance
EO 12856, P2 and Right-to-Know in the Government	August 3, 1993	Requires each federal facility to present EPA with a P2 plan for reducing its total releases of toxic pollutants to the environmental and off-site transfers of such wastes for treatment and disposal by 50 percent by December 31, 1999; P2 plans due December 31, 1995. Installations to support agency-wide goals
EO 12873, Federal Acquisition, Recycling and Waste Prevention	October 20, 1993	Establishes high-level positions within each federal agency responsible for implementing P2 and recycling into daily operations and for increasing markets for recovered materials
EO 12902, Energy Efficiency and Water Conservation at Federal Facilities	March 8, 1994	Requires federal facilities to (1) achieve energy and water conservation goals by implementing more efficient technologies and (2) conserve nonrenewable resources by using alternate energy sources
Deputy Under Secretary of Defense (Acquisition Reform) Process Action Team Report title "Blue Print for Change"	March 1994	Describes recent studies and approaches for DoD acquisition reform and P2
DoD Comprehensive Pollution Prevention Strategy Memorandum (CPSM)	August 11, 1994	Lists objectives for DoD P2, including those of EOs 12856, 12873, and 12902 for P2 planning, life-cycle analysis, P2 training, energy conservation, and water conservation. Installations to support P2 strategy
OPNAV P45 120 10 94, Navy Shore Installation P2 Planning Guide	October 1994	Provides guidance for Navy shore installations preparing and implementing P2 plans and programs; also summarizes Navy P2 goals
OPNAVINST 5090.1B, P2 Policies and Procedures	November 1994	Describes minimum requirements for Navy P2 programs and plans
Guidance on Executive Order 12856: Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements	April 1995	Document prepared by EPA to serve as voluntary interpretive guidance for federal agencies covered under EO 12856.

TABLE 1.2
NAVY-WIDE P2 GOALS

P2 Element	Goals¹
HM Management	<ul style="list-style-type: none"> - Develop Authorized Use List (AUL) for each activity - Institute Consolidated Hazardous Material Reutilization and Inventory Management Program (CHRIMP)
Training, Awareness, and Incentive Programs and P2 Plans	<ul style="list-style-type: none"> - Develop by December 31, 1995
Hazardous Waste Generation	<ul style="list-style-type: none"> - Reduce by 50 percent by December 31, 1999²
Toxic Chemical Releases	<ul style="list-style-type: none"> - Reduce by 50 percent by December 31, 1999 [if subject to Emergency Planning and Community Right to Know Act (EPCRA) Section 313 reporting requirements]
Municipal Solid Waste	<ul style="list-style-type: none"> - Reduce by 20 to 80 percent (deadline not specified)²
Ozone-Depleting Substances (ODS) - Non-critical Class I ODS Solvent Applications - Halon 1211 Fire Extinguishers - Chlorinated Fluorocarbon (CFC) Air Conditioning and Refrigeration (AC&R) Equipment - Halon 1301 Fixed Fire Protection System	Item-Specific Goals <ul style="list-style-type: none"> - Eliminate by January 1996 - Remove by January 1996 - Convert or replace by December 21, 2000 - Convert or replace by December 31, 2000

Notes:

¹ Source: Navy 1994b

² The baseline year for measuring reductions is 1994.

SECTION 2

NS MAYPORT P2 POLICY

National defense and environmental protection must be compatible goals and the Navy is committed to operating ships and shore facilities in an environmentally-sound manner. Therefore, an important part of the Navy's mission is to prevent pollution; protect the environment; and conserve natural, historic, and cultural resources (Navy 1990). P2 is the Navy's preferred approach for achieving environmental management and protection goals (Navy 1994a). The NS Mayport P2 policy is presented below:

NS MAYPORT P2 POLICY STATEMENT

NS Mayport is committed to implementing the national policy of P2 to the maximum extent technically and economically feasible without compromising NS Mayport's primary national defense mission. This policy will be implemented by undertaking the following:

- i. NS Mayport will comply with all relevant federal, state, and local laws, and with DoD and Navy instructions and directives relevant to implementing a P2 program and this P2 plan.
- ii. NS Mayport will develop clear responsibilities and accountability for P2 both within and across tenant activities within the first year of developing this plan. The P2 organizational structure will build upon existing P2 responsibilities and programs.
- iii. NS Mayport will effectively promote the national policy of P2 through education, training and awareness programs, acquisition practices, facilities management, energy conservation, and the use of innovative P2 technologies.
- iv. NS Mayport will assess installation operations for P2 opportunities annually and implement feasible techniques and technologies to reduce pollutant emissions and off-site transfers of hazardous waste to meet installation-specific P2 goals.
- v. NS Mayport will integrate P2 concepts into ongoing environmental management programs and will demonstrate and export successful, innovative P2 technologies and management practices to other installations through the Navy Environmental Leadership Program (NELP).

NS Mayport will review and revise the policy statement above as necessary as part of the annual P2 plan update. Any necessary revisions will be made to ensure that P2 progress is maintained and that the goals discussed in Section 3 of this plan are achieved.

SECTION 3

P2 PLAN APPLICABILITY, SCOPE, AND GOALS

This plan addresses P2 as defined by the Pollution Prevention Act of 1990 and subsequent strategy and policy statements issued by EPA, Navy, DoD, and the President. P2 involves source reduction and other practices that reduce or eliminate pollutants to the maximum extent feasible through (1) increased efficiency in the use of materials, energy, water, or resources, or (2) protection of natural resources by conservation. P2 includes a multimedia, life-cycle approach to reduce hazardous materials use and hazardous waste generation. Sound P2 practices include “end-of-pipe” treatment technologies only as a last resort. The applicability and scope of the NS Mayport P2 plan and the installation’s goals are discussed below.

3.1 APPLICABILITY AND SCOPE

NS Mayport activities are subject to ongoing environmental management, hazardous waste minimization (HAZMIN), and P2 requirements and programs. NS Mayport is subject to EPCRA Section 313 reporting requirements, and NS Mayport will report toxic chemical release data as one entity in accordance with fence-line reporting requirements. NS Mayport will work with installation activities to ensure technology transfer and cooperation as its P2 plan is implemented.

P2 actions necessary to implement this plan will be incorporated into normal, routine technical, administrative, management, and all other ongoing functions and procedures at all organizational levels. NS Mayport will support the transfer of P2 concepts and procedures through training, technology transfer, and incentives to support P2 implementation for all NS Mayport activities described in this P2 plan. This P2 plan applies to: all NS Mayport organizational components and personnel; to tenant and installation activities; and to on-site contractors and their personnel. This plan does not include ships or the excess HM off-loaded from ships. The opportunity assessment conducted for the P2 Plan included industrial operations conducted by NAVAIR, NAVSEA, and NAVFAC organizations. The specific industrial operations visited are listed in Section 6 and Appendix D of this plan. The visited operations represent a number of different process types and significant uses of hazardous materials and generation of wastes.

Because this P2 Plan addresses multi-media reductions, a number of other plans developed for NS Mayport are related to or directly impact the P2 Plan. The related NS Mayport plans and instructions are listed in Table 3.1.

TABLE 3.1
P2 Related Plans and Instructions
NS Mayport, FL

Plan/Instruction Name	Date
Oil Waste/Waste Oil (OW/WO) Management Plan, Naval Station, Mayport	30 Sep 94
Instruction and Plan for Solid Waste Management, Naval Station, Mayport	Dec 93
Stormwater Pollution Prevention Plan (SWPPP), Naval Station, Mayport	Final by Fall 95
Spill Prevention Control and Countermeasures (SPCC), Naval Station, Mayport	Oct 94
Facility Response Plan (OPA90), Naval Station, Mayport	Feb 95
SOPA (Admin) Mayport Instrucion 5090.1B (NAVSTA Mayport Hazardous Waste Management Plan)	22 Apr 94

3.2 P2 GOALS

3.2.1 Hazardous Material Management

The Hazardous Material Minimization (HAZMIN) Program at NS Mayport addresses the issue of optimizing the use of hazardous materials resulting in increased savings through lower procurement coasts and reduced disposal costs. The program centrally controls all hazardous materialon the Naval Station in order to optimize resources and reduce costs.

At the HAZMIN Center at Mayport, a trained team of military and civilian personnel control all the hazardous materials for tenant commands. Currently, 55 tenant commands and 13 departments at NS Mayport have switched over to the HAZMIN program. Homeported ships participate in the program. Future goals include implementing HAZMIN centers on all homeported afloat commands and bring government contractors on-line with the station's program.

3.2.2 Training and Awareness Programs

The Navy-wide goal for this area is to develop training and awareness programs that lead to P2 plans at the installation level by December 31, 1995. In 1994, NS Mayport volunteered as a test installation for prototype P2 plan development. NS Mayport supplied preliminary process data to CNO and its contractor in early 1994. A P2 assessment was conducted in June 1994 by a contractor in cooperation with NS Mayport staff. Based on assessment findings, this P2 plan has been developed for NS Mayport.

NS Mayport is committed to implementing proactive, aggressive P2 training and awareness programs. A process action team (PAT) was officially chartered in early 1994 by the Mayport Navy Environmental Leadership Program (NELP) ESC to address environmental training and awareness issues. The team is made up of representatives from the various departments and tenant commands at Mayport. The team's objectives are as follows:

1. Review, establish, and analyze Mayport's environmental requirements and compliance issues;
2. Evaluate existing environmental training and identify shortfalls;
3. Identify who is currently being trained, who should be trained, and prioritization of training;
4. Determine if existing training is meeting NS Mayport's requirements;
5. Make recommendations to improve environmental training across Mayport; and
6. Make recommendations on ways to improve environmental awareness across Mayport.

To date, the Environmental Training and Awareness PAT has reviewed environmental training requirements. OPNAVINST 5090.B1 requires environmental awareness training for all military and civilian personnel. The team aggressively set out to determine how this could be accomplished at Mayport. The team has been able to identify who needs training, what type of training, and when it is needed. The team developed a training curriculum that outlined all Navy, federal, and local environmental requirements.

Most recently, the team has prepared a pocket-size brochure packed with valuable information about the environmental program at Mayport. It contains environmental goals, endangered and threatened species found at the installation, phone numbers for the HAZMIN Center and Environmental Division, and the number to call in the event of a spill. The brochure is handed out at command indoctrination and awareness training courses. The team is currently working on developing an environmental awareness training video for use by all Mayport commands.

3.2.3 Pollutant Emissions

The Navy-wide goal for pollutant emissions reduction is 50 percent by December 31, 1999, using 1994 baseline data. The Navy will track these reductions using Emergency Planning and Community Right-to-Know Act (EPCRA) data. NS Mayport will submit EPCRA Section 313 Toxic Release Inventory (TRI) Form R data for all activities within its boundaries. Because 1994 baseline data will not be compiled and submitted until the summer of 1995, first year P2 goals in this plan are not chemical-specific. For 1995, all Section 313 chemicals have been weighted equally as P2 priorities. NS Mayport will focus on reducing Section 313 chemical emissions to the maximum extent technically and economically feasible from 1994 through 1999 in accordance with Navy P2 goals.

Focused P2 goals will be developed for inclusion in the 1996 P2 plan update based on the 1994 TRI data. In the future, NS Mayport will target chemical use and associated emissions for chemicals for which NS Mayport is above threshold reporting values or identifies special concerns based on data or regulatory requirements. Emissions of other chemicals will continue to be reduced but will become a secondary priority.

3.2.4 Hazardous Waste Generation

The Navy-wide P2 goal for hazardous waste generation is 50 percent reduction by December 31, 1999, using 1994 baseline data. NS Mayport is committed to reducing hazardous waste generation to the maximum extent technically and economically feasible. NS Mayport consistently reviews hazardous waste generation data to identify P2 opportunities, as required by the Navy HAZMIN Program. To evaluate P2 goals for this plan, NS Mayport reviewed previous hazardous waste reports for the last eight years to determine if significant reductions had already been achieved. Figure 3.1 summarizes total annual hazardous waste

generation rates. These data show that NS Mayport has not yet significantly reduced hazardous waste generation. Hazardous waste generation increased in 1993 and 1994 due to the decommissioning of several ships. The implementation of the hazardous minimization program led to the centralization of materials which consequently led to the clean out of many storage cabinets and disposal of unusable materials. Future activity levels are expected to increase within the next two years due to the arrival of the aircraft carrier, USS Kennedy, in the fall of 1995 and the possibility of a drydock pierside at Mayport.

3.2.5 Municipal Solid Waste Generation

The Navy-wide P2 goal for municipal solid waste generation is a 20 to 80 percent reduction using 1994 baseline data. No specific timeframe for achieving this reduction is included in the Navy P2 planning guidance (Navy 1994b). Florida state and local requirements have already significantly impacted NS Mayport municipal, or nonhazardous solid waste management. In 1988, the 1974 Florida Resource Recovery and Management Act (Section 403.701, Florida Statutes [F.S.]) was amended by the Solid Waste Management Act (SWMA). The SWMA established state goals, regulations, and suggested solid waste programs. A goal was set for 30 percent reduction in solid waste disposal by December 31, 1994. Of this waste to be reduced, no more than 50 percent of the recyclables can be met with yard trash, white goods, construction debris, and tires. By the end of 1994, at least 50 percent of the newspaper, aluminum cans, glass, and plastic bottles in the waste stream must be separated for recycling prior to final disposal at a solid waste disposal facility. The State has also imposed several deadlines for the separate handling of special wastes including construction and demolition debris, yard waste, white goods, batteries, and used automobile oil. NS Mayport's nonhazardous solid waste reduction goals is to meet state requirements.

Figure 3.1

The Morale, Welfare, and Recreation (MWR) Department at NS Mayport has been operating a nonhazardous solid waste recycling center since 1978 and has already significantly reduced solid waste recycling generation rates. The recycling center segregates and recycles ferrous and nonferrous metals, glass, paper, cardboard, and aluminum cans. At present, recycling at NS Mayport is a cooperative effort between many agencies, contractors, and tenant commands. Table 3.2 presents recycling data for fiscal year 1991-92 from MWR's annual recycling report. The table includes all materials recycled except those materials collected from family housing and pallets sold directly to a market.

TABLE 3.2
Annual MWR Recycling Report
NS Mayport, FL

Category	1991 Data		1992 Data	
	Tons	Revenue	Tons	Revenue
Paper	41.64	\$ 1,943.63	104.96	\$ 5,186.46
Newspaper	12.06	154.35	20.06	181.22
Carboard	75.07	1,632.95	330.93	8,023.42
Wood and Pallets	2.52	360.00	39.52	680.65
Glass	0.00	0.00	14.59	521.41
Aluminum Cans	13.78	10,239.90	12.64	8,595.01
Plastic	0.15	32.85	0.47	9.45
Food Waste Garbage	0.00	0.00	18.39	80.00
Aluminum	145.13	104,411.24	76.29	41,293.20
Brass	0.00	0.00	0.00	0.00
Steel	1,744.69	40,989.11	985.94	31,610.31
Copper	92.19	142,224.22	37.08	37,766.02
Hi-temp Alloys	0.00	0.00	0.00	0.00
Stainless Steel	83.81	34,387.00	24.50	9,300.00
Tin Cans	3.29	21.50	2.15	21.50
Batteries	0.00	0.00	0.78	61.50
TOTAL	2,214.33	\$ 336,396.75	1,668.30	\$ 143,300.15

Sources: 1) NAVSTA Mayport Solid Waste Annual Report

Municipal solid waste P2 program goals and milestones for Mayport include the following:

- Implement the NS Mayport Solid Waste Management Plan (SWMP). The SWMP final draft was completed in December 1993.
- Prepare and submit solid waste annual reports (SWARs) as required by OPNAVINST 5090.1B.
- Continue to closely track municipal solid waste generation.
- Continue reducing nonhazardous solid waste generation as required by state requirements and Navy policy to achieve a 50 percent reduction goal by the year 2000, using 1990 baseline data.

3.2.6 Ozone Depleting Substances (ODSs)

The Navy-wide goals for this area are listed in Table 1.2. NS Mayport has performed an in-house ODS study for non-mission critical uses of ODS and has developed a draft plan to meet Navy goals for ODS phaseout. The draft plan is included in Appendix B.

SECTION 4

INSTALLATION INFORMATION

This section includes the following installation information: (1) NS Mayport's mission statement, (2) geographical information, (3) nature of operations and activities, and (4) a summary of current P2 efforts. This descriptive information provides a basis for external plan reviewers to understand the installation and for internal plan users to understand this plan's relationship to ongoing initiatives and missions.

4.1 MISSION STATEMENT

NS Mayport's mission is "Finest Service to the Finest Fleet." NS Mayport's vision statement is "We are the showcase of excellence and port of choice for:

- Customer Service
- Quality of Life
- Environmental Stewardship
- Community Involvement

The guiding principles are honor, commitment, and courage."

Over the years, this mission has evolved to include environmental management efforts as required by federal, state, and local environmental regulations and directives. NS Mayport has incorporated environmental management into all activities conducted as part of its naval support and aviation support mission.

4.2 GEOGRAPHICAL INFORMATION

NS Mayport lies on the south bank of the St. Johns River at its confluence with the Atlantic Ocean, formerly the site of Ribault Bay. Ribault Bay (i.e., the Turning Basin) was filled in some areas to accommodate on-shore construction. Coastal marsh and tidal creeks can be found to the west of Route A1A south of the dredge spoil piles. Of the total acreage occupied

by NS Mayport, approximately half is wetlands, brackish marsh, sand spits, beach and dunes and dredge spoil areas.

The facility encompasses 3,514 acres, of which 1,667 acres is brackish marsh, sand spits, beach (vegetated and nonvegetated), and dredge spoil areas. Other land-use areas on NS Mayport include lawns, roadsides, and a golf course (527 acres); irregularly mowed road and runway shoulders (420 acres); buildings and pavement (387 acres); and managed forest (285 acres). Lake Wonderwood, a 20-acre freshwater lake, is located at NS Mayport.

The southwestern section of the complex is open land, including wetland areas, which is constrained by the explosive limit arcs emanating from the ordnance magazines. Consequently, development at the facility is limited in large measure by the existing site conditions and the land use pattern that has been developed both on and off base. The northern and eastern boundaries of the facility prohibit direct land use conflicts. The western portion is entirely covered by wetlands. The Intracoastal Waterway also passes through this section.

4.3 OPERATION AND ACTIVITIES

The NS Mayport Naval facility is comprised of two installations: the Naval Station (NS) and the Naval Air Station (NAS). As of June 1, 1992, these installations were combined under one entity: NS Mayport. NS Mayport covers an area of approximately 3,514 acres; 2,909 acres are occupied by NS Mayport and 605 acres are occupied by NAS. The NS Mayport facility is located within the corporate limits of the city of Jacksonville, Florida, and is approximately 12 miles to the northeast of downtown Jacksonville, and 5 miles north of the communities of Atlantic Beach, Neptune Beach, and Jacksonville Beach. This location, along the south bank of the St. Johns River, provides ships with quick, direct access to the open sea which is less than four miles away.

Activities at NS Mayport are centered around the Turning Basin and its wharfs which are located around its perimeter located in the northeast section of the facility. Ship berthing facilities are provided at 14 wharfs located in the Turning Basin, which is directly connected to the St. Johns River by a 600-foot wide channel. A total of 30 ships is expected to be homeported at NS Mayport by 1995. These ships will include aircraft carriers, guided missile destroyers, guided missile frigates, and miscellaneous small service craft necessary for

maintenance operations. Also located at NS Mayport are bachelor enlisted quarters, family housing, and community and recreational facilities.

NS Mayport is currently host to ten tenant commands and 26 supported unit commands which are distributed within the facility boundary. An 8,000-foot long runway is also located at NS Mayport. Although at one time four runways were operational, only the northeast-southwest oriented runway is presently in use. The other runways have been demolished or are unusable. At present, five LAMPS MK III helicopter squadrons are based and are fully active at NS Mayport.

Naval interest in Mayport began in 1939 when the Navy initiated a study for development of an aircraft carrier basin in the Mayport vicinity, and recommended Ribault Bay. In 1941, Congress voted to develop the Mayport site for patrol and crash boat training. Subsequently, to meet wartime needs for a base in the South Atlantic, the Mayport Basin was dredged to a depth of 29 feet and used by patrol and rescue craft. In 1942, the Mayport Basin was commissioned as a U.S. Naval Submarine Base.

The Mayport basin was dredged to a depth of 40 feet and the first carrier berth was completed in 1952. At that time the mission of the base was increased to provide support facilities for regular operations of fleet carrier aircraft; to support aircraft carriers, destroyers, and other vessels; and to support fleet aircraft staging functions and fleet carrier aircraft landing practice. With these expanded facilities and two homeported carriers, NS Mayport was established.

During the 1960s, NS Mayport continued to expand with the construction of new housing, medical facilities, and officer clubs. Growth at NS Mayport continued in the 1970s, 80s, and 90s with construction of additional community facilities and assignment of additional homeported ships. Currently, NS Mayport is the fourth largest Navy homeport in the United States, employing approximately 20,000 active duty personnel and 3,000 civilians.

4.4 SUMMARY OF CURRENT POLLUTION PREVENTION EFFORTS

The Navy initiated formal HAZMIN efforts in 1987, in response to state and federal requirements. Some of NS Mayport's past and current HAZMIN and P2 efforts are listed below:

- NS Mayport prepares biennial reports documenting hazardous waste generation and minimization efforts as required by the Resource Conservation and Recovery Act (RCRA) Hazardous and Solid Waste Amendments of 1984.
- NS Mayport tests and implements innovative technologies for waste minimization and P2. Examples include implementing mechanical stripping to replace solvent stripping and replacing solvents with nonaqueous degreasers, where feasible.
- NS Mayport has implemented a centralized HM distribution center to improve inventory control and reduce HM use and hazardous waste generation associated with outdated HMs.
- NS Mayport conducted a P2 assessment in cooperation with CNO in February 1994 to provide input to many aspects of this P2 plan. P2 assessments are one component of a sustainable P2 Program and will be conducted periodically to review operations as they evolve, identify P2 opportunities, and document P2 results. P2 options identified as a result of the P2 assessment are included in Sections 6 and 7 of this plan.

NS Mayport is committed to innovative approaches for improving and streamlining environmental management, as evidenced by this installation's selection as one of two NELP test sites in November 1993. NELP was conceived in 1992 as a test program to identify, demonstrate, and export innovative technologies that improve environmental management. One of NELP's four program components is P2, and ongoing P2 efforts under NELP have been documented into the remainder of this plan.

SECTION 5

MANAGEMENT AND ADMINISTRATIVE ELEMENTS

This section discusses the management and administrative components required to implement the P2 plan, including: roles and responsibilities, P2 plan review and revision, P2 progress measurement and reporting, HM management procedures, P2 training and awareness, and provisions for information exchange. Process-related improvements and P2 priorities are discussed in Sections 6 and 7.

5.1 ROLES AND RESPONSIBILITIES

Clearly defined roles and responsibilities are necessary to ensure that this P2 plan is implemented and P2 goals are achieved. To help develop roles and responsibilities, NS Mayport has established a Quality Management Board (QMB) to focus on P2. The QMB is authorized to charter process action teams (PATs) to address specific issues related to compliance, cleanup, conservation, and P2. The QMB objectives are as follows:

- Review, establish, and analyze Mayport's Compliance, Cleanup, Conservation, and Pollution Prevention (C3/P2) requirements;
- Review P2 options in the Pollution Prevention Plan and make recommendations to implement plan;
- Evaluate technology demonstration contractors and brief the Executive Steering Committee (ESC);
- Assist/evaluate P2 programs on ships at NS Mayport and coordinate recommendations to improve the institution of the CHRIMP system on board homeported ships.
- Set short-term goals and make recommendations on ways to achieve 50 percent reduction in toxic releases and off-site transfers by each activity.

- Make recommendations on ways to achieve 50 percent reduction in hazardous waste generation by the end of calendar year 1999;
- Make recommendations on ways to achieve 50 percent reduction in municipal solid waste; and
- Track and review the progress of other QMBs chartered by the ESC. Currently, there are three other QMBs addressing environmental awareness and training, ship's force maintenance, and oil spills.

The QMB will review the P2 priorities outlined in Section 7. Each representative will review the projects that apply to his/her department/command. The representative will address utility requirements, site constraints, design, procurement, or construction requirements and any additional cost that may be associated with the projects. The QMB will then make recommendations and prioritize the projects. The projects will be forwarded to the Environmental Division for submission into the A106 process.

The QMB currently consists of members from Public Works Center, Southern Division Naval Facilities Engineering Command, Naval Base Jacksonville, Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP), Destroyer Squadron Eight, Fleet Industrial Center, Florida Department of Environmental Protection, and NS Mayport.

5.2 P2 PLAN REVIEW AND REVISION

To remain a current and useful document, the P2 plan will be updated annually. These updates will allow NS Mayport to review progress against the POA&M, update the POA&M and plan, and take corrective actions as necessary so that adequate progress is maintained. NS Mayport will review and revise this plan annually until December 31, 1999, beginning in January 1996. The P2 Plan revisions will take into account the results and recommendations of the QMB.

5.3 P2 PROGRESS MEASUREMENT AND REPORTING

As of calendar year 1994, all federal agencies are required to comply with provisions in Section 301 through 304 and 311 of EPCRA, as required by EO 12856. Section 313 of EPCRA requires facilities that use Section 313 chemicals at levels above established threshold levels to

report chemical use and releases. NS Mayport meets threshold reporting requirements for Toxic Release Inventory (TRI) data (often termed the Form R report) under Section 313 of EPCRA.

NS Mayport will submit Section 313 data as the host command for all activities within the facility fenceline, in accordance with EPCRA requirements (Navy 1994a). TRI data for 1994 will be submitted no later than July 1995 and will provide the baseline for measuring P2 progress for reportable chemicals and releases at NS Mayport through December 31, 1999. Databases developed under EPCRA will be used to prepare reports for subsequent reporting years and to measure P2 progress. TRI data will be used to revise and focus P2 goals. For 1995, NS Mayport will focus P2 efforts on all Section 313 chemicals equally because this plan is being prepared before 1994 data are available. After 1995, the installation will focus P2 efforts on chemicals for which it exceeds EPCRA threshold reporting values.

The Environmental Division will work closely with installation environmental representatives to collect data, prepare annual EPCRA Section 313 submissions, and demonstrate P2 progress for all facility activities and processes. In addition, the Environmental Division will document projects that reduce HM use or hazardous waste generation, or increase energy, raw material, and water use efficiency. Although P2 in resource conservation areas will not be documented through the Section 313 EPCRA requirements, these projects constitute P2 under the Pollution Prevention Act of 1990 and will help achieve other P2 goals discussed in Section 3.

5.4 HAZARDOUS MATERIALS MANAGEMENT PROCEDURES

A key element of a successful P2 program is developing a HM use and waste generation baseline and procedures for measuring HM and waste generation P2 progress. NS Mayport has established procedures for tracking HM use and hazardous waste generation and will use these systems to provide data for documenting current conditions and P2 progress. NS Mayport's AULs will provide a tool for evaluating HM use and identifying less-hazardous material substitutions. CHRIMP will be used to document HM use and reutilization.

Annual hazardous waste reports will be used to track hazardous waste reductions for the P2 program. These reports will be prepared by the station's Hazardous Waste Coordinator. In addition, NS Mayport is establishing a TRI database that will be completed by December 1995 so that 1994 and subsequent annual TRI data can be stored and P2 progress can be documented

for EPCRA Section 313 chemicals. Current NS Mayport procedures and databases for tracking and managing HM and hazardous waste are included as Appendix B.

5.5 P2 TRAINING AND AWARENESS PROGRAMS

Personnel training and awareness are critical to achieving P2 program success. NS Mayport is implementing a program that provides P2 training and awareness to P2 responsibilities. NS Mayport began this training program by sending installation staff responsible for preparing and implementing this P2 plan to a training session hosted by NFESC in December 1994. NS Mayport plans to conduct P2 workshops for the P2 PAT, environmental managers, and process line personnel during the 1995 calendar year. Workshop content will be based on the training categories outlined in OPNAVINST 4110.2 for HMC&M and training needs identified during the June 1994 P2 assessment. General workshop topics are presented in Table 5.1.

TABLE 5.1
GENERAL P2 TRAINING TOPICS

General Topic	Subjects to be Addressed
P2 Terms and Concepts	<ul style="list-style-type: none"> - Definition of P2 and associated terms - P2 techniques and examples - Navy and DoD case study examples
Legal Requirements and Guidance Documents	<ul style="list-style-type: none"> - RCRA, EPCRA, SB 14 and 1726 - EOs 12856, 12873, 12902 - DoD and Navy directives and instructions - EPA's Common Sense Initiative
NS Mayport P2 Program	<ul style="list-style-type: none"> - Program overview and components - P2 roles and responsibilities - P2 goals and milestones - Past and current P2 initiatives and results
NS Mayport P2 Plan	<ul style="list-style-type: none"> - Key elements of the plan - P2 plan review and revision - P2 progress documentation
NS Mayport P2 Program Issues and Potential Barriers	<ul style="list-style-type: none"> - Present issues and barriers - Anticipated issues and potential barriers - Measures to address issues and barriers

The above topics will be included in the general training program. Each training workshop will then be customized to recipient roles and responsibilities. For example, process-specific P2 topics will be included for process staff. Paint shop staff will learn about P2 for coating operations (such as paint removal, surface preparation, painting, and equipment cleaning). Navy experience with relevant technologies will be presented and discussed. Facility-

specific incentives and barriers will also be addressed. The QMB will have significant input to customized training program development for NS Mayport staff.

5.6 PROVISIONS FOR INFORMATION EXCHANGE

P2 information exchange will be an ongoing and evolving component of the P2 program at NS Mayport. Current mechanisms for information exchange include the QMB and general environmental training and awareness workshops and programs. These mechanisms will transfer P2 information within and across installation activities. NELP provides a mechanism for exporting successful P2 technologies to other Navy installations and throughout DoD. NELP includes funding and technology transfer tools to export successful P2 technologies. Example tools include videos, technology demonstrations, and fact sheets. Another mechanism that NELP will use to identify innovative P2 technologies and export successful technologies is the DoD on-line P2 library. This library is an electronic bulletin board system being coordinated by NFESC.

SECTION 6

PLANNED PROCESS - SPECIFIC IMPROVEMENTS

6.1 INTRODUCTION

A process assessment was conducted for NS Mayport as part of the prototyping and refining of the procedures for developing P2 plans for Naval shore installations. While this process assessment covered a wide range of processes at the major tenants at NS Mayport, it was not comprehensive. It focused on the major industrial processes using toxic chemicals and/or generating hazardous waste and was intended to identify processes where pollution can be eliminated or reduced. A complete list of the process sites visited is included in Appendix D.

This section summarizes the results of this process assessment. An implementation plan for improvements is presented in the following section. Procedures and methodologies used for this evaluation are presented in Appendices. Table 6.1 provides a guide to documentation presented in this report.

Specific procedures that were used for data collection and data analysis are presented in Appendix C. Organizations that were surveyed during the site visit are summarized in Appendix D. As described in Appendix C, the process assessment included the following steps:

- Initial site visit;
- Review of existing data and preparation of a Work Plan;
- Organization of the process assessment team;
- Kick-off briefing;
- Data collection;
- Data reduction;
- Technical options evaluation; and,
- Economic Analysis

Table 6.1

The results of the process assessment are presented in the following section. Worksheets and resulting data for each step of the process assessment are presented in Appendices E through I.

6.2 REPRESENTATIVE PROCESSES SELECTION METHODOLOGY

6.2.1 Introduction

The purpose of this P2 plan is to identify major processes that use toxic chemicals (Navy target compounds) and/or generate hazardous waste and present technically and economically feasible options for reduction in release. During the data collection site visits, 176 process sites were visited. The P2 team interviewed workers and obtained detailed process information including quantities of materials used and wastes generated. A set of 15 worksheets was used for data collection and evaluation. Sample worksheets are presented in Appendix E. Information collected on the worksheets was compiled into a data base. Process information, process material, and process waste information collected on Worksheets 1, 2, and 3 are summarized in Appendix F, Tables F.1, F.2, and F.3, respectively.

6.2.2 Navy Target Compounds

For this P2 study, the Navy targeted 320 compounds from Appendix E of the Navy Shore Installation Pollution Prevention Planning Guide (OPNAV P45 120/1094) for reduction. An additional 30 compounds, including ozone-depleting substances (ODSs) and EPA 17 compounds which were not on this list, were added to the list. A final list of 350 Navy target compounds is presented in Appendix C and the 30 compounds added to the original list have been separately identified. All toxic chemicals listed in 40 CFR Part 372.65 and required for Form R for reporting year 1994 are included in the list of 350 chemicals. For process materials used at NS Mayport and listed in Table F.2, material safety data sheets (MSDSs) were used to identify chemical composition of these materials. Target compounds in each of the process materials were identified. A list of process materials containing target compounds and quantities of target compounds by percent is provided in Appendix G.

6.2.3 Data Analysis

Process materials were grouped into ten categories based on their use: painting, coating, thinners, strippers; petroleum products and antifreeze; degreasing solvents and alcohols; pesticides and herbicides; detergents and cleaners; adhesives and sealants; acids and bases; non-destructive inspection and photographic chemicals; and miscellaneous. A materials grouping report is presented in Appendix G. A summary of process material quantities by grouping and process sites is provided in Appendix H.

The process materials-used and wastes-generated information collected for the process sites was often inconsistent; hence, a material balance (material accounting) was performed on each of the process sites to balance quantities of materials entering a process with quantities leaving the process. Quantities of materials leaving processes as waste streams were segregated by their environmental fates as solid waste, hazardous waste, air emission, or waste-water. Quantities of materials consumed in processes were also calculated. Balanced quantities of materials and wastes for each process site are summarized on Worksheet 13 and presented in Appendix I for all individual sites. Quantities of segregated waste streams for each process site (fate calculations) are presented in Appendix J. Quantities of Navy Target compounds used and released by each process were also calculated during the material accounting and are presented in Appendix K.

6.2.4 Identification of Major Processes

Of the 176 process sites visited, material accounting was performed on 146 process sites. Thirty process sites that either used insignificant quantities of hazardous material, had insufficient information collected to perform a material accounting, or had no P2 options were eliminated from further evaluation. Table 6.2 provides a list of eliminated processes and reasons for elimination.

Through material accounting, the quantity of hazardous wastes, air emissions, wastewater, solid waste, and target compounds released by each process to the environment was determined. The quantity of hazardous materials and target compound usage was also determined. First, the remaining 146 processes were sorted in descending order based on the quantity of hazardous waste generated. The top one-third processes generated 78,900 pounds of hazardous waste, or 90 percent of the total quantity of hazardous waste generated by the 146

Table 6.2 (2 pg)

processes evaluated (88,000 pounds per year). The 146 processes were again sorted in descending order based on the quantity of target compounds used by each process. The top one-third of the processes used a total of 711,000 pounds of target compounds or 99 percent of the total target compound usage from all of the 101 processes evaluated (715,000 pounds per year). As the top one-third processes from both lists were the major contributors of hazardous waste generated and target compounds used, these process were identified as major processes.

6.2.5 Representative Process Selection

Industrial maintenance activities performed at NS Mayport can be divided into seven major groups (general process groups); painting operations; fluid changeout and lubrication operations; degreasing and cleaning operations; operations using adhesives/sealants; battery operations; non-destructive testing and photographic operations; and miscellaneous operations. From the identified major processes, processes for further P2 evaluation were selected to represent each of the general process groups. A list of processes selected for further P2 evaluation with quantity of hazardous waste generated and target compounds used is presented in Table 6.3. These processes generated 61,300 pounds of hazardous waste and used 689,000 pounds of target compounds; or 70 percent and 96 percent, respectively, of the total quantities for the 146 processes surveyed. These processes organized by general process groups with respective Navy process group and code are presented in Table 6.4.

6.2.6 Processes for Future Consideration

Processes AIID999902, SIID020702, SIID060501, and PMID050001 included in Table 6.2 with control organization and building numbers were eliminated from further consideration due to inadequate information available for these processes. Accurate materials and waste information will be required for these process sites before opportunity assessment can be performed.

Table 6.3 (2 pg)

Table 6.4 (3 pg)

6.3 PROCESS GROUP DESCRIPTIONS

6.3.1 Introduction

Potential P2 options were evaluated for seven general process groups. Individual processes were assigned to one or more groups that characterized the processes' operations. The seven process groups along with the associated processes that comprise the groups are presented in Table 6.3. Each of these process groups is described in this section and general process flow diagrams (PFDs) are also presented to summarize the typical process for each group. Appendix A contains selected site-specific PFDs for processes not represented by the general PFDs. Process materials in a related group are evaluated as part of that group; however, unrelated process materials in a particular group are evaluated in other associated groups. For example, a solvent in a vehicle maintenance process that is part of the Fluid Changeout/Lubrication Operations group would actually be evaluated in the Degreasing/Cleaning Operations group. Hazardous materials used and wastes generated for each process are summarized in the material accounting tables presented in Appendix I.

6.3.2 Painting Operations

Painting Operations at NS Mayport are classified as painting in dry filter paint booths (Figure 6.1), painting in water wall paint booths (Figure 6.1B), and open air/touch-up painting (Figure 6.1C). Paints and coatings are applied to vehicles and equipment with spray guns (conventional or high efficiency), brushes, and aerosol cans. Several types of materials are used for coatings in Painting Operations, including primers, enamels, epoxies, polyurethane, and lacquers. Thinners are often mixed with paints prior to application.

Wastes generated from the painting processes include used rags, water and filters from the paint booths, paint and solvent waste, and empty paint and aerosol cans. Used rags contaminated with paint and solvent are disposed as solid waste, hazardous waste, or laundered (recycled) in a few cases. Waste paint, paint sludge, and used solvents are disposed as hazardous waste. Wastewater from the water wall is disposed through the sanitary sewer after the paint sludge has been separated. Dry filters and empty cans are disposed as solid waste.

Figure 6.1

Figure 6.1B

Figure 6.1C

6.3.3 Fluid Changeout/Lubrication Operations

Fluid Changeout/Lubrication Operations at NS Mayport include processes that perform either fluids changeout/purging (typically involving vehicles, aircraft, and associated equipment) or facility maintenance (involving general industrial equipment maintenance). Processes that perform fluid changeouts and facility maintenance use a wide variety of materials, but only petroleum products (such as oils and greases), antifreeze, and various other related materials (such as filters) are evaluated in the Fluid Changeout/Lubrication Operations group.

A generalized PFD for the Fluid Changeout/Lubrication Operations is shown in Figure 6.2. Oil is changed or topped-off in equipment, vehicles, and aircraft. Waste oil is collected and recycled offsite. Most oil filters are drained, crushed, and recycled offsite, but some oil filters are drained and disposed as nonhazardous solid waste. Antifreeze is also changed or topped-off in vehicles. Waste antifreeze is disposed through PWC for off-site treatment. Used rags generated from general maintenance activities are either laundered for reuse or disposed as solid waste or hazardous waste, depending on the wastestream. Waste fuels collected directly from vehicles, equipment, or aircraft are usually separated in fuel/water separators and recycled offsite.

6.3.4 Degreasing/Cleaning Operations

Most components and parts usually require cleaning or degreasing prior to processing or installation. Commonly employed cleaning methods in Degreasing/Cleaning Operations include tanks, pressure washers, squeeze or spray guns, aerosol cans, wipe rags, or compressed air canisters. The type of solvent or cleaner varies considerably basewide.

Safety-Kleen® solvent is a very commonly used degreaser on base. The solvent is used in tanks and is collected and recycled offsite by the Safety-Kleen® contractor as shown in the PFD in Figure 6.3A. Petroleum-based solvents like PD-680 and naphtha are used in small quantities in tanks and are disposed as hazardous wastes as shown in the PFD in Figure 6.3B. Thinners, methyl ethyl ketone (MEK), isopropyl alcohol (IPA), or other cleaners/solvents are used for spot cleaning or hand wiping of parts and usually evaporate or are disposed with the waste rags as shown in Figure 6.3C. Aqueous cleaners may be used in a pressure washer with the waste being disposed as wastewater and recovered sludge from the oil/water separator being disposed as hazardous or solid waste.

Figure 6.2

Figure 6.3

Figure 6.3 (continued)

6.3

Aircraft and aircraft engine washing are also performed at NS Mayport. Aircraft are washed on the flight line with a cleaning compound (usually an alkaline-based cleaner or solvent degreaser) that can be applied with conventional hoses and pressure washers. Wastewater from this process flows to an oil/water separator that discharges to the sanitary sewer. Waste oil from the separator is disposed offsite. The aircraft cleaning process is presented in Figure 6.3D.

6.3.5 Operations Using Adhesives/Sealants

The Operations Using Adhesives and Sealants mainly include processes that have been assigned to another group, but the adhesives and sealants are being evaluated separately from the other materials in those groups. Adhesives and sealants are applied using rags, cotton swabs, and dip tanks to various equipment and structures. A PFD for the operations using adhesives/sealants is shown in Figure 6.4. Once applied, most of these compounds are used/consumed in the process, but some release fugitive air emissions. A small portion of these materials, in the form of unused, expired product or spill cleanup residue, may be disposed as either solid waste or hazardous waste.

6.3.6 Battery Operations

The Battery Operations processes are categorized by two types of procedures: battery reconditioning (Figure 6.5A) and battery replacement (Figure 6.5B). Lead-acid batteries, the main type of batteries evaluated in this study, are reactivated with sulfuric acid. Various quantities of sealed lead-acid batteries used in vehicles and generators are recharged. Wastes produced in battery reconditioning include sulfuric acid-contaminated rags and washwater, which are mainly disposed offsite as hazardous waste through PWC. Lead-acid batteries that can no longer be charged are sent to Defense Reutilization and Marketing Office (DRMO) for off-site recycling. Some batteries that have been damaged are disposed as hazardous waste through PWC.

6.3.7 NDI/Photographic Operations

The NDI/Photographic Operations involve both the various equipment inspections and the medical x-rays taken at the hospital and dental offices. Nondestructive inspection (NDI) is performed on equipment parts to detect engine wear and locate structural defects. Fluorescent penetrate (Figures 6.6A and 6.6B), magnetic particle, x-ray, eddy current, and ultrasound inspection are methods that may be used to locate stress fractures. Engine wear is evaluated by

Figure 6.4

Figure 6.5A & B

Figure 6.6

Figure 6.6 (continued)

analyzing engine oil for metal content. Small quantities of dye penetrates and developers are brush and spray-applied when cleaning parts to detect wear and defects. Inspection compounds are either rinsed off with water or wiped off with rags and cleaners. Wastewater is discharged to the sanitary sewer, and rags are disposed as hazardous waste.

Medical processes involving x-rays are also included in NDI/Photographic Operations. X-rays are taken in both the general hospital and the dental office, and a generalized PFD is presented in Figure 6.6B. Fixers and developers are used to develop the film, and after film development, silver is separated from the fixer/developer solution. The silver is recycled and the waste fixer/developer solution is disposed as hazardous waste. Old film is disposed through DRMO for silver recovery.

6.3.8 Miscellaneous Operations

Miscellaneous Operations at the NS Mayport include all processes that could not be grouped in the previous six operations. Although many unique operations exist in the Miscellaneous Operations group, only the major operations will be described (mechanical metal cleaning, used rag generation, and paint stripping).

Mechanical metal cleaning is an operation in which a blasting device or gun discharges blasting media (glass beads, sand, shells, or metal pellets) at a part to remove paint or rust. The blasting media are usually recycled within the process for reuse. Dust and paint chips are disposed as hazardous waste, as are blasting media which cannot be recycled again. A general mechanical metal cleaning PFD is presented as Figure 6.7A.

Used rags are generated in most processes on base, but the rags are evaluated separately from the processes. Depending on the waste products on the used rags, used rags may be disposed as hazardous waste or solid waste, or laundered (recycled) by an off-site contractor. Of approximately 30,000 pounds of used rags generated by the NS Mayport, approximately 40 percent is disposed as solid waste, 32 percent is disposed as hazardous waste, and 28 percent is laundered by an off-site contractor.

Figure 6.7

Chemical paint stripping at the NS Mayport is performed in tanks or by applying the stripper directly to parts with rags or a spray gun. The tank process uses a chemical-stripping bath and a rinsewater bath to remove paint from small parts. The coatings are scraped off parts where the stripper is applied with rags or a spray gun. Hazardous wastes from the stripping process include waste stripper, removed coatings, rinsewater, used rags, sponges, mops, and brushes. A generalized PFD for chemical paint stripping processes is shown in Figure 6.7B.

6.4 TECHNICAL FEASIBILITY EVALUATION OF OPTIONS

For each of the seven general process groups, a comprehensive set of P2 options were identified. Each option, if implemented, would result in reduction of all or some of the following:

- Hazardous Material Usage
- Hazardous Waste Release
- Toxic Chemicals Usage
- Toxic Chemicals Release
- Air Emissions
- Wastewater
- Health Risks for Workers

Options identified for general process groups were applied to all selected process sites within that group. Technical feasibility of all applicable options were evaluated. A set of three worksheets, 9 through 11, was used for this evaluation. Criteria used for technical feasibility evaluation of each option included:

- Commercial Availability
- Safety
- Space/Utility Limitations
- Training Requirements
- Compliance Issues
- Compatibility

Options found to be technically infeasible were eliminated from further P2 evaluation. Also, any options requiring changes to military specifications were eliminated as those decisions need to be made by the cognizant engineering authority. A detailed description of the technical

feasibility evaluation methodology is provided in Appendix C. A complete technical evaluation of options, including completed worksheets, is presented in Appendix L.

The results of this evaluation are summarized by departments and tenant commands as indicated below:

Departments

- Aircraft Intermediate Maintenance Department (AIMD)
- Morale, Welfare and Recreation Department (MWR)
- Security Department
- Weapons Department
- CBU 420
- Harbor Operations
- Medical Clinic

Tenant Commands

- Helicopter Anti-submarine Light Squadron (HSL)
- Public Works Center (PWC)
- Shore Intermediate Maintenance Activity (SIMA)
- Supervisors of Ship Building
 - Atlantic Marine
 - North Florida Shipyard
- Navy Exchange

Results are summarized in Tables 6.5 through 6.16.

6.5 ECONOMIC ANALYSIS OF OPTIONS FOR IMPROVEMENTS

An economic analysis was performed for all the options that were found to be technically feasible. Worksheets 12 and 13 were used for this evaluation. For the proposed options, all applicable cost factors such as capital cost for process equipment, installation of equipment, site preparation, etc. were considered. Associated labor costs for personnel training, procurement, environmental management, operations and maintenance (O&M) costs were also considered. A uniform labor rate of \$20 per hour is used. Purchase and disposal costs of materials and wastes and utility costs provided by NS Mayport are used.

SECTION 7

P2 PRIORITIES

7.1 INTRODUCTION

Technically feasible options that had an economic analysis performed were ranked for final prioritization. A detailed description of the ranking methodology is presented in Appendix C. Worksheets prepared for each option for ranking are presented in Appendix M. A summary of the results for process-specific improvement priorities is presented in the following section. Administrative priorities and management priorities were also identified and are discussed in Sections 7.6 and 7.7, respectively.

7.2 RANKING METHODOLOGY

Eight criteria were considered for ranking of options for prioritization. These eight criteria were selected to take into account the practicality, economic benefits, and reductions that can be achieved by implementing the proposed options. For each criteria, an option would receive zero, one or two points. A maximum of 16 total points could be scored by an option. In general, options receiving higher points would provide greater economic benefits and reductions, and therefore would have a higher priority for implementation. Although state, local, and safety issues were usually evaluated during the technical feasibility task, it is recommended the NS Mayport consider these issues during the implementation planning stages of the P2 project.

Two criteria were used for determining the practicality of options; option type and ease of implementation. For example, source reduction, the preferred method for pollution prevention receives two points compared to one point for recycling, which is less preferred. One economic criterion consisting of two parts, payback period and net present value of benefits and investments, was used in combination to determine economic benefits of options. For example, a combination of a payback period of less than three years and a positive net present value of benefits and investment would receive two points, compared to a payback period of greater than three years and a positive net present value of benefits and investments which would receive one point. Five criteria for reducing the usage of ODSs, released target chemicals, air emissions, wastewater and hazardous waste were used. Reductions of each criterion for every option were calculated on Worksheet 14. To develop ranges for ranking, the

data were compiled separately on a spreadsheet for each criterion and a statistical analysis was performed. Standard deviation and averages for each of the five data sets were calculated. Due to the variance observed in the original data, natural log of the original data points was used to calculate standard deviation and average. Zero point score was assigned for reductions in the range of zero to one standard deviation less than average. Reductions in the range of one standard deviation were assigned one point score. Reductions greater than one standard deviation from average were assigned two point score. The eight criteria used for this evaluation and ranges for ranking are presented in Table 7.1.

7.3 PROCESS-SPECIFICIMPROVEMENT PRIORITIES

The identified P2 options for general process groups were applied to 42 process sites. Options for rags were applied basewide. Prioritization scores ranged from 11 to 2 out of a possible 16 total points. The P2 option final prioritization scoring is summarized in Table 7.2, arranged in descending order. One option applicable to two process sites scored the highest points, a total of 11 points. Two options scored a total of ten points, four options scored nine points, and nine options scored eight points. In general, all but one option that scored eight or more points are economically beneficial with immediate payback or a payback period of less than three years.

For Painting Operations, the option recommending use of a high volume/low pressure spray gun scored more than a total of seven points and had a payback period of less than three years for all processes to which it was applied. All other options either scored seven or less total points or had a payback period of greater than three year.

For Degreasing/Cleaning Operations, 19 options out of 32 options scored seven or more points. Only two options out of the 19 options had a payback period of greater than three years. Option recommending solvent substitution for high volatile organic compound (VOC) solvent was the most beneficial option economically and for reductions.

For Fluid Changeout/Lubrication Operations, only two of the 13 options scored more than a total of seven points. These two options recommending use of a particle counter for testing of hydraulic oil and testing of antifreeze scored a total of nine points each.

TABLE 7.1

tABLE 7.2

7.4 IMPLEMENTATION PLAN

For development of an implementation plan, evaluated options were arranged in descending order based on the point scores, as shown in Table 7.3. This table shows the recommended priority for option implementation at NS Mayport. Processes for which multiple options were evaluated, only one option was selected for implementation.

Within each point category, options are organized by Net Annual Operating savings for each option. Options not included in the implementation plan are duplicate options, presented in Table 7.4. The duplicate options are viable options and could be considered by the Navy as alternatives to the recommended option.

7.5 OPTION IMPLEMENTATION COSTS AND BENEFITS

A total of 60 options is included in the implementation plan. These options are summarized in Table 7.3 with estimated reductions, costs and benefits. If implemented, these options would reduce released ODSs by 2,400 pounds, target chemicals by 8,100 pounds, air emissions by 9,000 pounds, and hazardous waste by 35,000 pounds annually. The estimated investment cost and net annual operating savings are \$64,000 and \$560,000, respectively.

Sixteen additional P2 options summarized in Table 7.4 include alternatives to options selected for implementation. As these options are not recommended for implementation, reductions, costs, and benefits have not been totalled.

Table 7.3 (4 pg)

Table 7.4

7.6 ADMINISTRATIVE PRIORITIES

NS Mayport has established a QMB to focus on P2. This board is authorized to charter PATs to address specific issues related to compliance, cleanup, conservation, and P2. The QMB objectives are as follows:

1. Review, establish, and analyze Mayport's C3/P2 requirements.
2. Review P2 options in P2 plan and make recommendations to implement plan.
3. Evaluate technology demonstration contractors and brief the ESC.
4. Assist/evaluate P2 program on ships at NS Mayport and coordinate recommendations to improve the institution of the CHRIMP system on board homeported ships.
5. Set short-term goals and make recommendations on ways to achieve 50 percent reduction in toxic chemical releases and off-site transfers by each activity.
6. Make recommendations on ways to achieve 50 percent reduction in hazardous waste generation by the end of calendar 1999.
7. Make recommendations on ways to achieve 50 percent reduction in municipal solid waste.
8. Track and review the progress of other QMBs chartered by the ESC. Currently, there are three other QMBs addressing environmental awareness and training, ships' force maintenance, and oil spills.

No specific administrative priorities have been set at this time. The QMB will establish priorities in CY95 and they will be included in the CY96 plan update.

7.7 MANAGEMENT PRIORITIES

The QMB will review all P2 priorities established in Section 7. Each representative will review the projects that would apply to his/her department/command. The representative will address utilities requirements; site constraints; design, procurement, or construction requirements and any additional cost that may be associated with projects. The board will then make recommendations and prioritize the projects. The projects would be forwarded to the Environmental Division for submission into the A106 process.

SECTION 8

POTENTIAL BARRIERS TO P2 PLAN

As with any new or developing program, potential barriers to P2 program implementation must be anticipated and addressed. The QMB will provide an ongoing mechanism for identifying and addressing such barriers. P2 barriers identified through past experience and Navy approaches for overcoming these barriers are presented below.

Navy maintenance and process manuals and military specifications specify standard operating procedures and specific chemical requirements. These requirements impede changeovers to more efficient processes or less hazardous materials. The Navy is currently addressing such barriers and NS Mayport will support such efforts through NELP.

Regulatory requirements may impede P2 implementation by (1) providing conflicting media-specific goals or mandates, (2) imposing cumbersome permitting requirements on P2 technologies, or (3) mandating best available control technologies rather than promoting a cooperative relationship with regulators to anticipate and address potential regulatory barriers to P2.

A lack of training and awareness and multiple job responsibilities may impede individual efforts to implement P2. Each individual must understand the benefits of P2 and be provided with incentives to integrate P2 into an already busy schedule. NS Mayport's training, awareness, and incentive programs (currently under development) should help reduce this potential barrier.

Incomplete cost accounting under current accounting systems may limit each department's incentive to reduce waste generation. For example, hazardous waste generation and disposal costs are not currently charged to the generating activity. Improved cost accounting and reporting systems will help reduce this barrier.

NS Mayport expects that additional potential barriers will be identified as the P2 program develops over time. Identifying these barriers and addressing them will be important elements of ongoing P2 efforts.

SECTION 9

OTHER REQUIREMENTS

NS Mayport is continually incorporating existing, new, and evolving federal, state, and local environmental protection requirements into ongoing mission-related activities. NS Mayport's policy is to comply with all applicable federal, state, and local regulations. This section summarizes other regulatory and policy requirements, including (1) Solid Waste Management Plan (SWMP) requirements, and (2) ODS requirements. Such requirements will be incorporated into P2 training and awareness workshops so that installation staff become more aware of the integrated nature of currently existing environmental requirements and programs. Other requirements are discussed below.

9.1 SWMP REQUIREMENTS

SWMP requirements are presented in relation to municipal solid waste management in Section 3.2.5. OPNAVINST 5090.1A (Navy 1990) requires all Navy shore installations to develop and implement SWMPs. The intent of the SWMP is to identify options to improve solid waste management of NS Mayport effectively minimizing the necessity for landfill disposal as mandated by OPNAVINST 5090.1B, Chapter 14. This chapter requires all Navy installations to comply with federal, state, and local solid waste management requirements. OPNAVINST 5090.1B also requires each installation to develop a Qualified Recycling Program (QRP) to reclaim scrap metal, high-grade paper, corrugated cardboard, aluminum cans, and to compost yard waste where feasible. NS Mayport has already established a QRP and is making great strides in implementing its recycling program.

The SWMP summarizes existing practices at NS Mayport; reviews applicable regulations; describes waste generation and waste characteristics; and outlines options for improvement in the areas of recycling, source reduction, yard waste management, construction and demolition debris management, collection and disposal, and promotion and education of solid wastemanagementprograms. Topics covered in the SWMP include the following:

Section 1.0 Regulations

Section 2.0 Solid Waste Generation and Characterization
Section 3.0 Source Reduction and Reuse
Section 4.0 Recycling
Section 5.0 Yard Trash Management
Section 6.0 Collection and Disposal of Solid Waste at NS Mayport
Section 7.0 Waste Requiring Special Handling
Section 8.0 Construction and Demolition Debris
Section 9.0 Public Education

The Solid Waste Program Manager is responsible for the following:

1. Managing solid waste program for NS Mayport;
2. Collecting and maintaining solid waste records quarterly from PWC, MWR, DRMO, etc. (this information will be used to prepare the SWMP);
3. Updating and coordinating the SWMP annually;
4. Evaluating all processes on base that generate solid waste to determine if the SWMP is current and to identify potential recyclable materials, source reduction ideas, etc.; ensuring that all new processes incorporate steps to reduce the weight, volume, and toxicity of solid waste generated;
5. Providing assistance to generating organizations for programming projects, requesting equipment or services for solid waste recycling, and identifying source reduction/substitution alternatives; and
6. Developing recyclable material collection plan and coordinating collection and delivery of materials. Recyclable materials not accepted by DRMO may be sold to commercial dealers. All receipts and expenses shall be reported to the Environmental Manager.

9.2 ODS PROGRAM REQUIREMENTS

Installations are required to prepare ODS plans for converting or replacing ODS equipment to meet Navy-wide schedules (see Table 1.2). These requirements are P2-related

because they will require NS Mayport to implement substitute, less hazardous materials to replace ODS. NS Mayport has prepared a draft ODS phase-out plan which is included as Appendix B.

SECTION 10
COMMANDING OFFICER'S STATEMENT AND APPROVAL

This section provides the commanding officer's statement and approval for the P2 plan.

I have reviewed the contents of the NS Mayport P2 Plan and certify that this plan contains the best available and accurate information. I support NS Mayport's P2 policy and certify that appropriate funding and management commitment will be provided to achieve P2 progress as described in this plan.

Commanding Officer Signature

Date

SECTION 11

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Navy. 1994b. OPNAV P45 120 10 94. Navy Shore Installation P2 Planning Guide. October.

Naval Civil Engineering Laboratory (NCEL). 1993. Hazardous Waste Database Management.

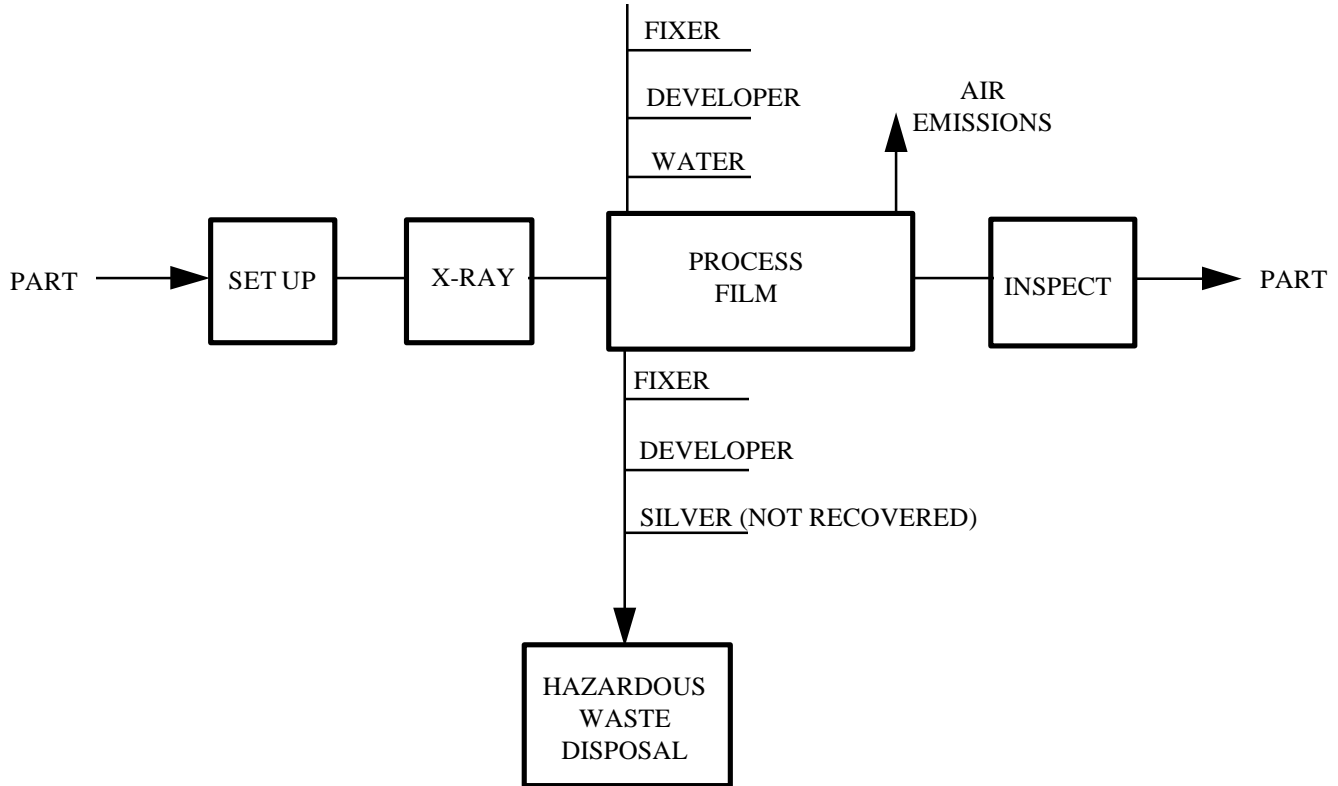
APPENDIX A

SELECTED SITE-SPECIFIC PROCESS FLOW DIAGRAMS

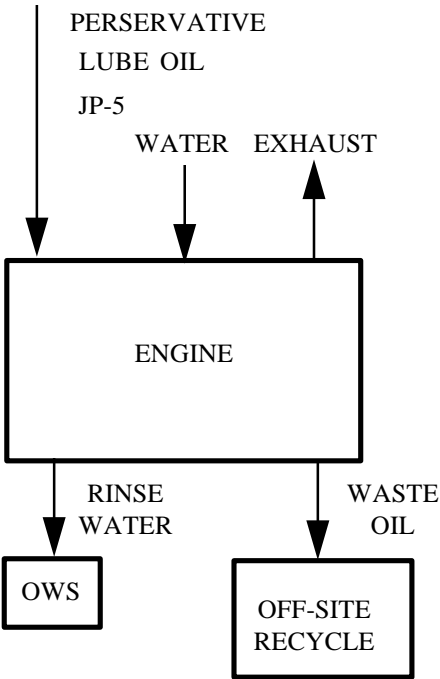
This appendix contains process flow diagrams (PFDs) of selected processes which were not represented by the generic PFDs presented in Section 6. PFDs are included for the following processes:

AIID010501	Bead Blast Paint Removal
AIID140401	NDI - Ultra-sonic
AIID140601	NDI - X-ray
AIID230901	Engine Testing
AIID999902	Nickel Cadmium Battery Shop
HOML020001	Flight Line Servicing
PMSR04020	HVAC Maintenance
SIID060101	Varnish Tank
SIID201220	Staining
SISR129930	Photo Engraving
SUID140302	Dye Penetrant Testing
WPML019901	Ordnance Storage/Handling

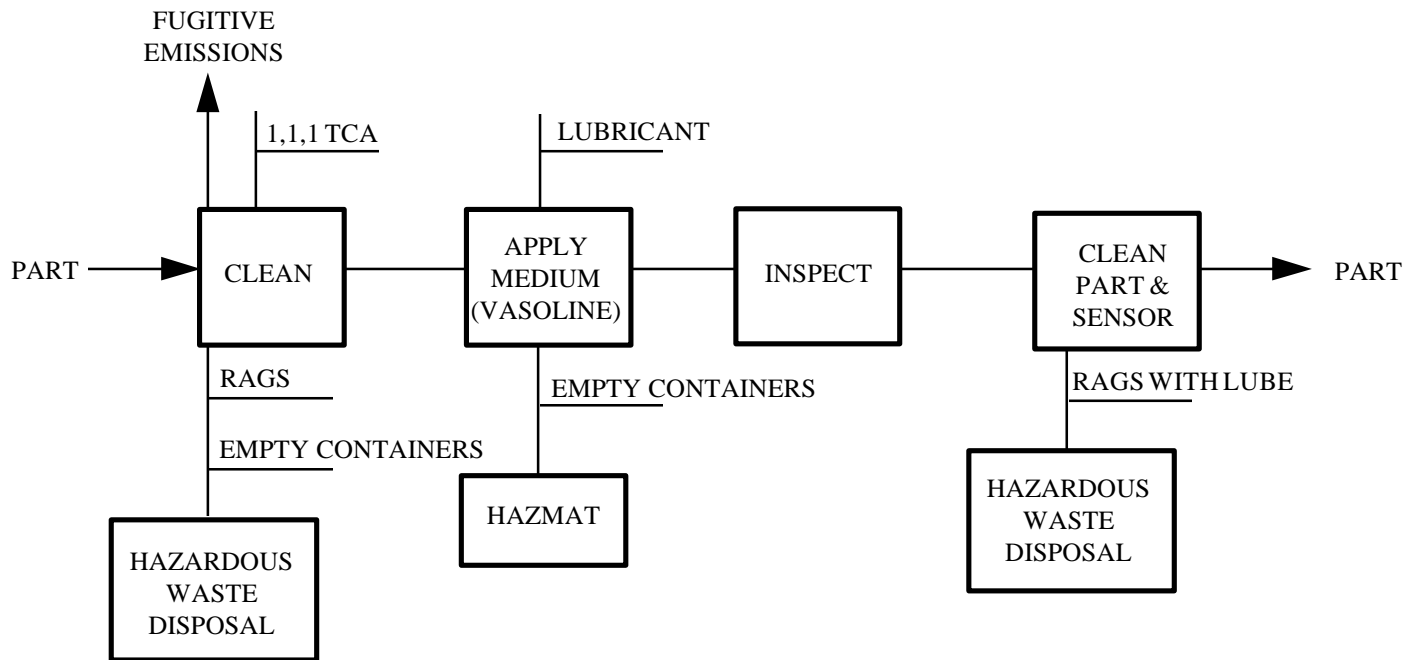
**NDI - X-RAY
(AIID140601)
NS MAYPORT, FL**



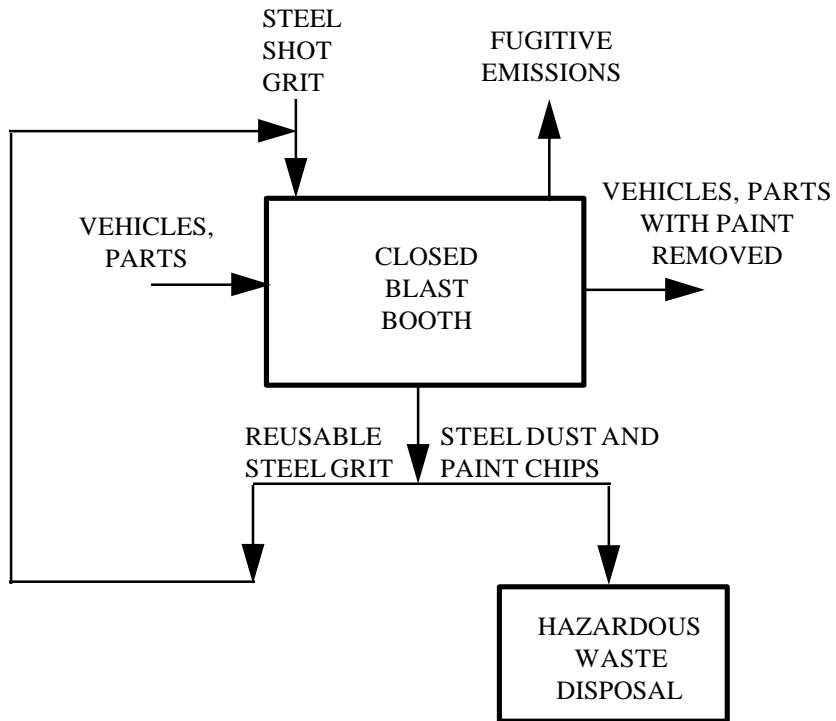
ENGINE TESTING
(AIIID230901)
NS MAYPORT, FL



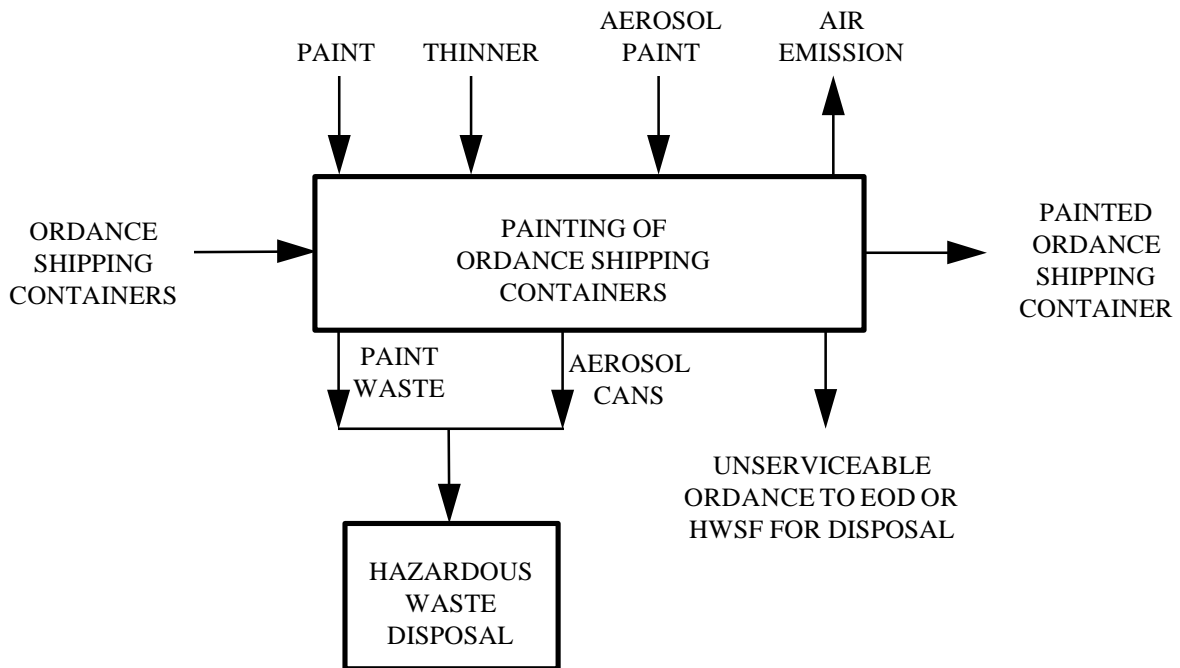
**NDI - ULTRA-SONIC
(AIID140401)
NS MAYPORT, FL**



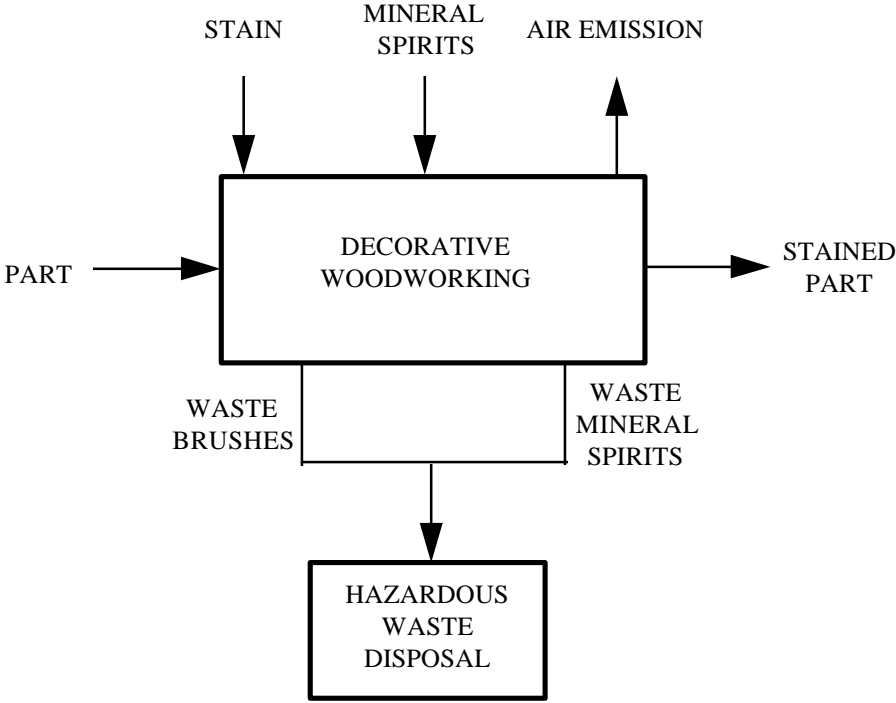
BEAD BLAST PAINT REMOVAL
(AIID010501)
NS MAYPORT, FL



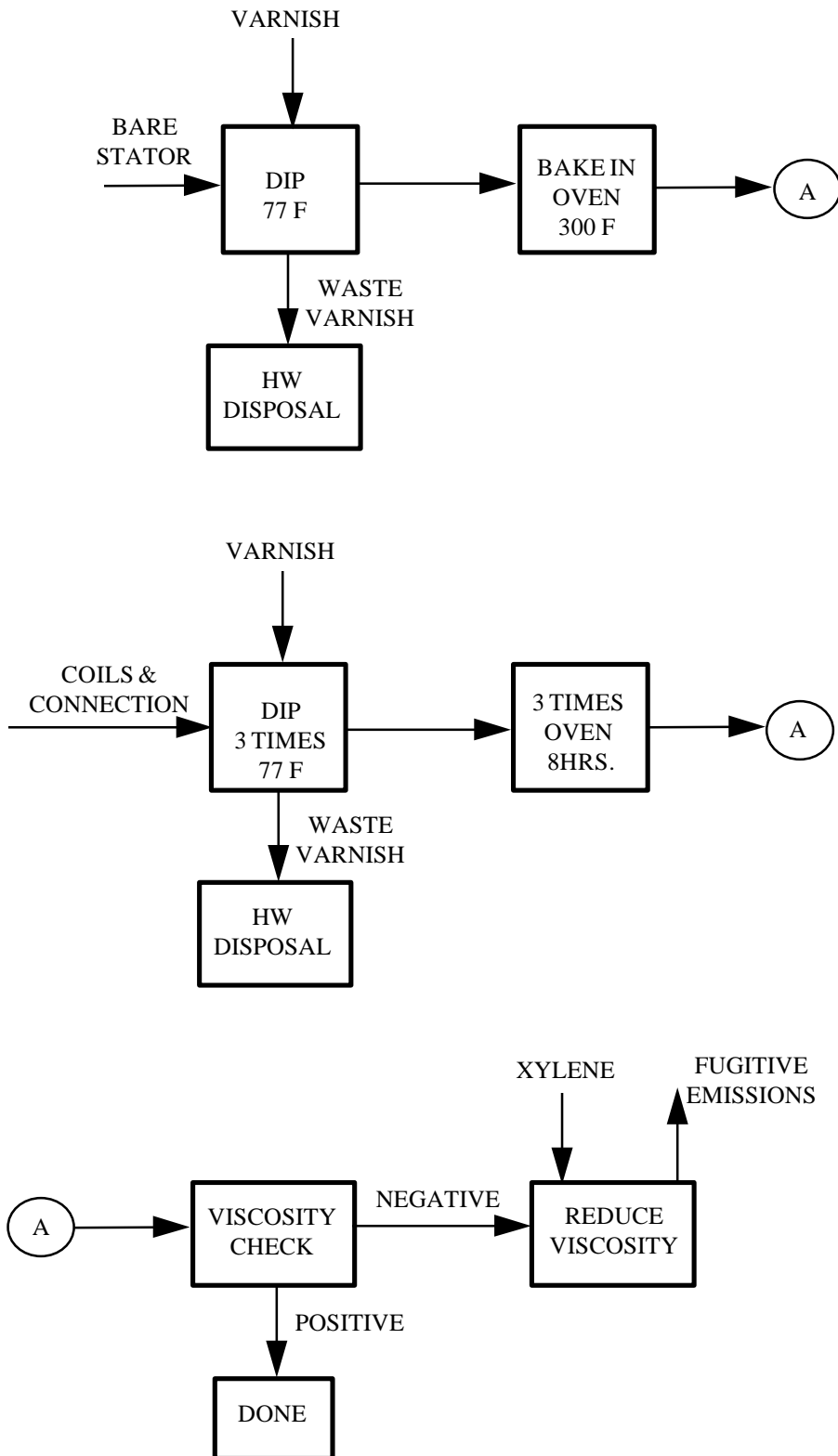
**ORDANCE STORAGE/HANDLING
(WPML019901)
NS MAYPORT, FL**



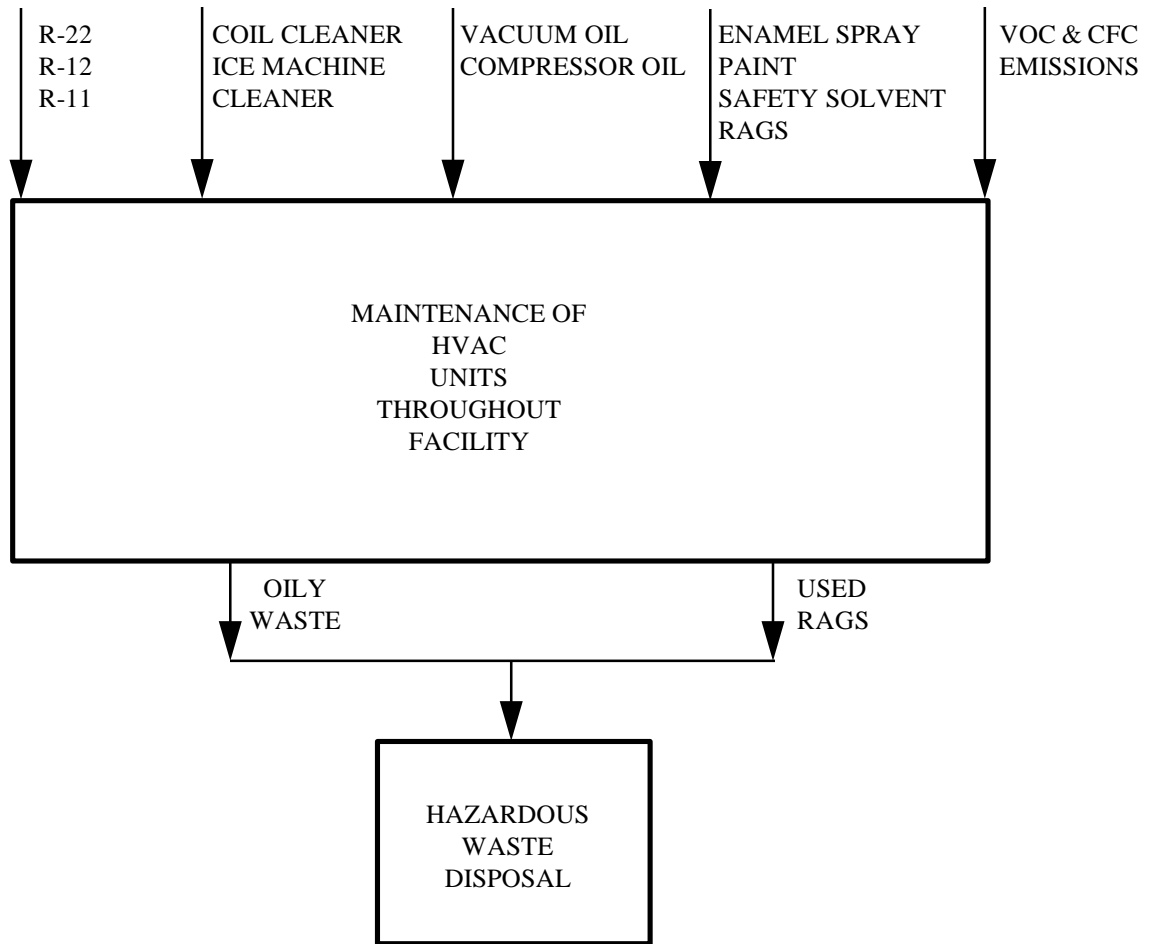
**STAINING
(SIID201220)
NS MAYPORT, FL**



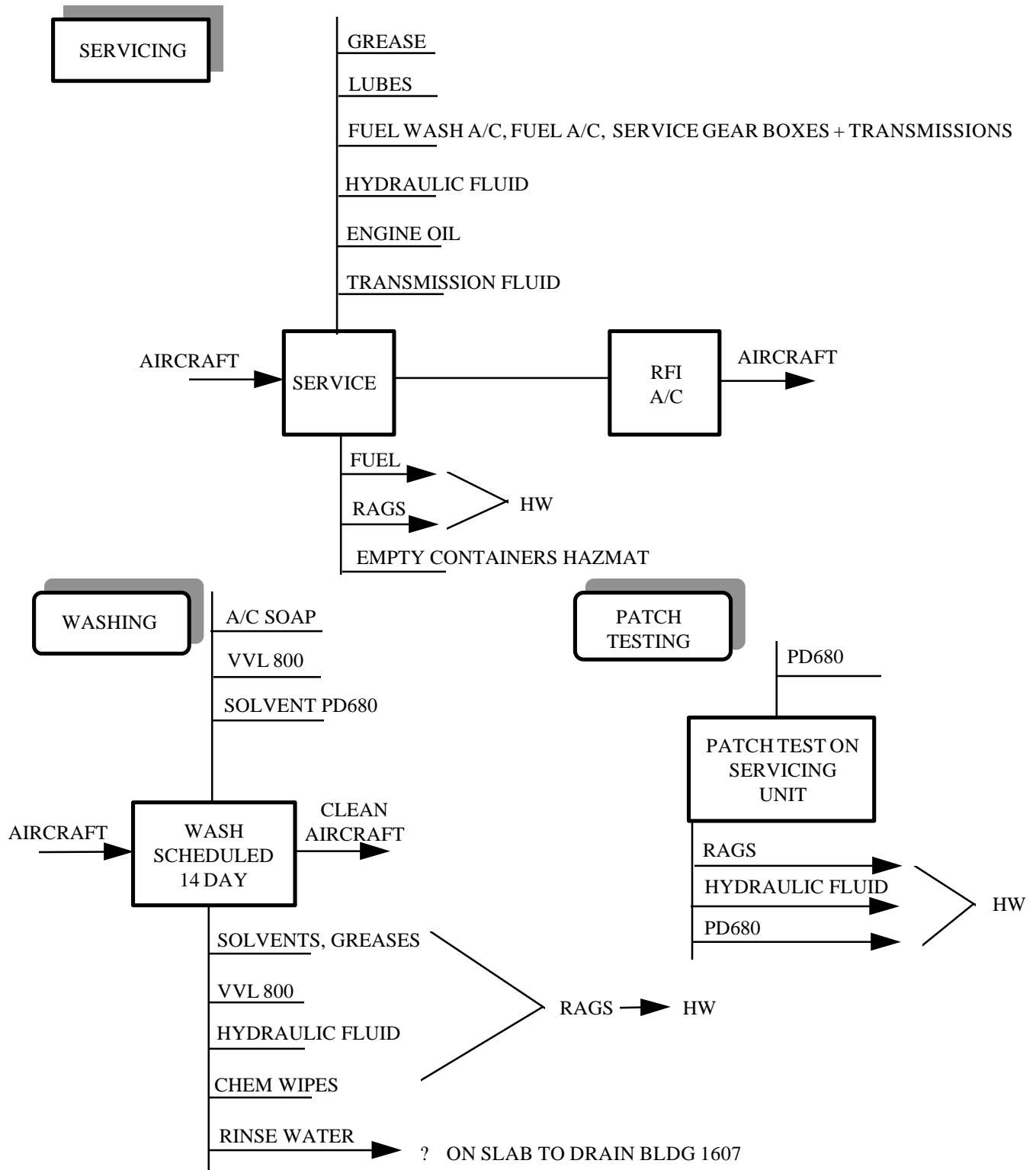
**VARNISH TANK
(SIID060101)
NS MAYPORT, FL**



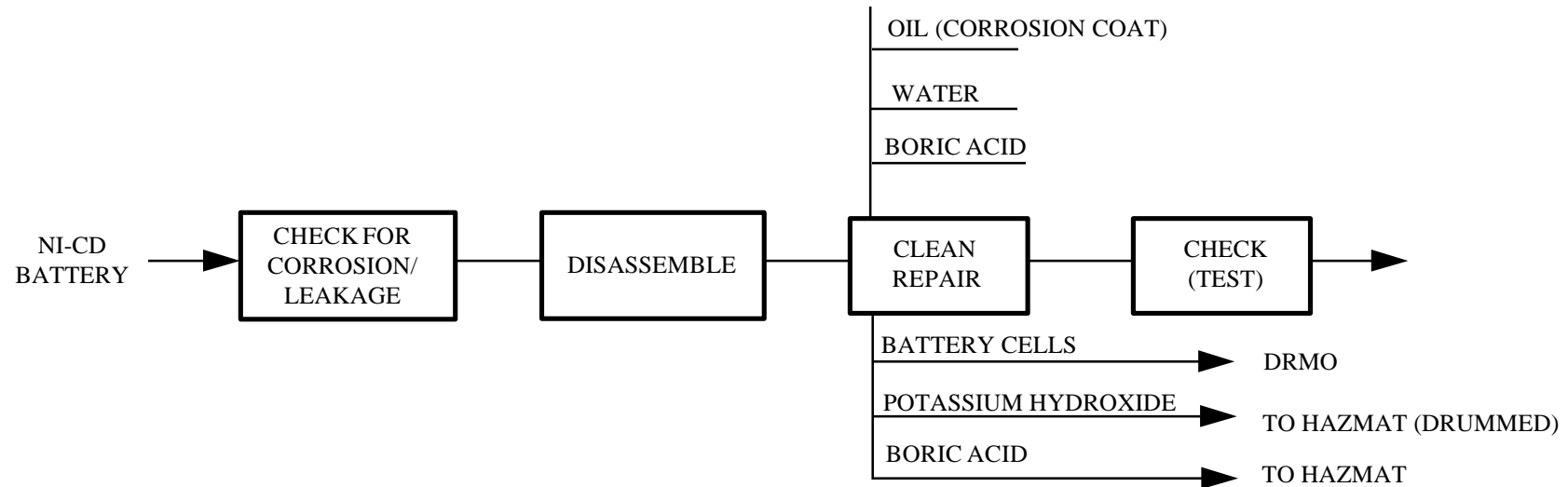
**HVAC MAINTENANCE
(PMSR04020)
NS MAYPORT, FL**



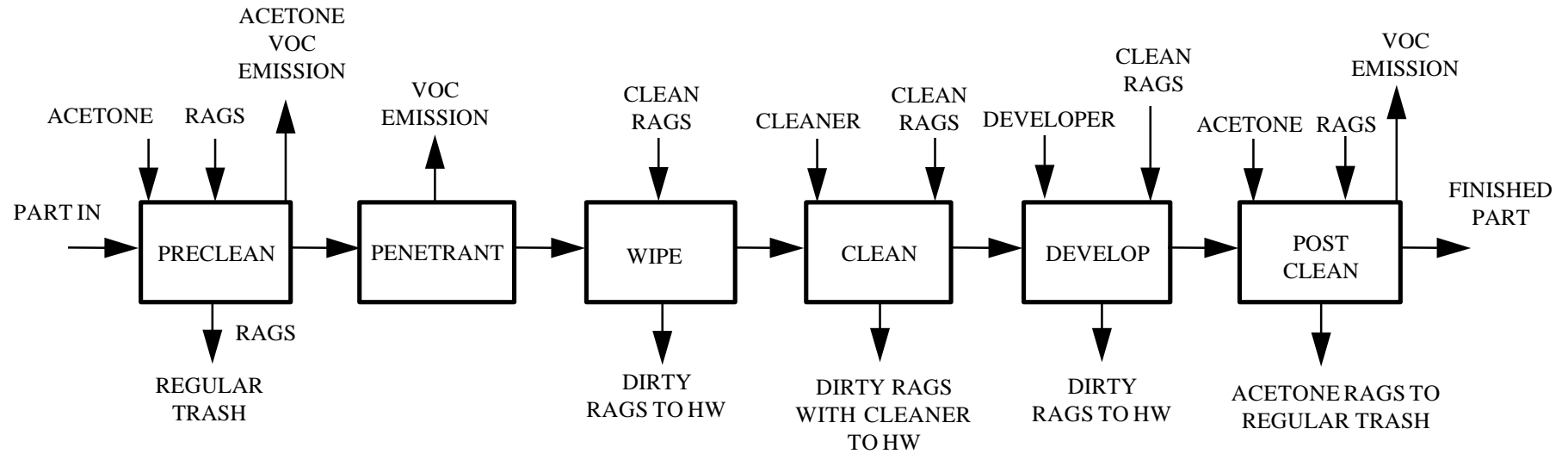
**FLIGHT LINE SERVICING
(HOML020001)
NS MAYPORT, FL**



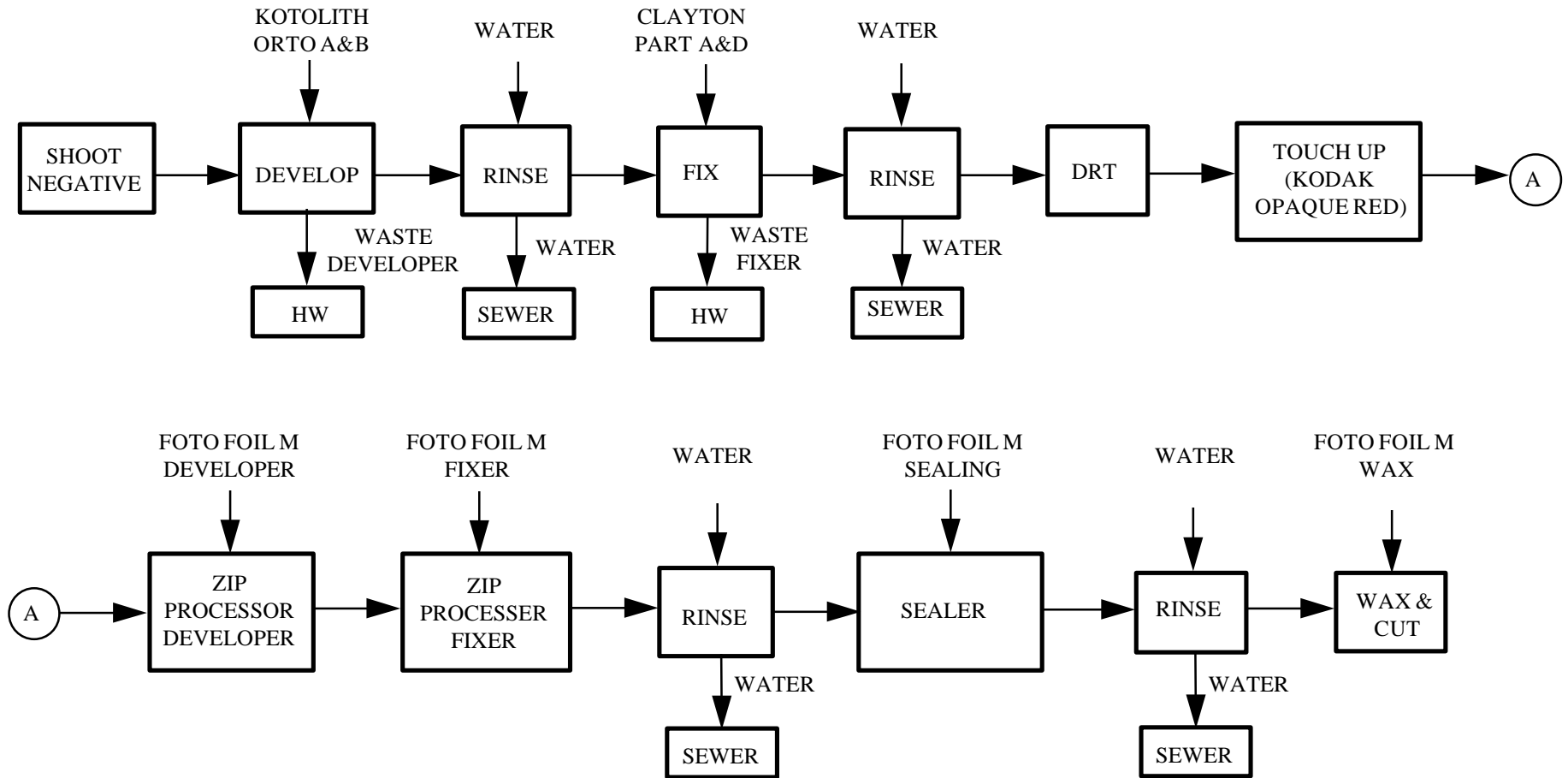
NICKEL CADMIUM BATTERY SHOP
(AID999902)
NS MAYPORT, FL



**DYE PENETRANT TESTING
(SUID140302)
NS MAYPORT, FL**



**PHOTO ENGRAVING
(SISR129930)
NS MAYPORT, FL**



APPENDIX B

DRAFT OZONE DEPLETING SUBSTANCES (ODSs) PHASE-OUT PLAN

NS MAYPORT

1.0 INTRODUCTION

1.1 Authority

This Ozone Depleting Substance (ODS) Management/Phase-Out Plan is prepared in accordance with OPNAVINST 5090.1B, which requires activities to develop an ODS phase-out plan in accordance with all applicable federal, state, local regulations and Navy policies. This ODS plan provides guidance and policy for all Ships and Afloat Commands present at Mayport and all Shore Activities at Mayport.

1.2 Applicability

OPNAV Instruction 5090.1B, "Environmental and Natural Resources Program Manual," Chapter 6, provides the best available information regarding the official Navy policy towards complying with the Clean Air Act Amendments of 1990, Section 608, "Nation Recycling and Emission Reduction Program." The following Navy policies and procedures regarding phase out of ODSs are applicable to NS Mayport:

A. General (Non-mission Critical) Use of ODSs:

Refrigerant Use:

- (1) Class I Ozone Depleting Substance (ODS) will no longer be manufactured after 31 December 1995. Class I ODS refrigerants include CFC-11, CFC-12, CFC-115, R-500, and R-502. Users of these refrigerants will have to conserve their stocks through containment programs and through recycling/recovery.

- (2) As of 31 December 2000, all use of Class I ODS refrigerants in non-mission critical applications will cease. All equipment containing 5 pounds or more of Class I ODS refrigerants will be replaced or retrofitted to use an EPA Significant New Alternatives Program (SNAP)-approved refrigerant with an ozone depletion potential (ODP) of 0.05 or less.
- (3) For small appliances containing less than 5 pounds of a Class I ODS refrigerant, the appliance can be used beyond and does not ever require servicing. If the system is not hermetic and does require refrigerant recharging, it should be replaced or retrofitted to use an approved alternative.
- (4) A date for replacement or retrofitting of equipment containing Class II ODS refrigerants has not been established. The Class II ODS refrigerants include HCFC-22 and HCFC-123. Production phase-out of HCFC-22 is not scheduled until 2020. HCFC-123 is an approved replacement for CFC-11 and will not be phased out until 2030.
- (5) All non-mission critical shore based Halon 1301 systems will be replaced by 31 December 2000.
- (6) All non-mission critical Halon portable fire extinguishers will be removed by 1 January 1996.

Solvent Use:

- (7) Naval activities must find alternatives to ODS solvents used in non-mission critical applications.
- (8) In cases of mission critical applications, ODS solvents must be supplied by the activity through recycled or reclaimed sources after the 31 December 1995 production phase-out.

B. ODS Reserve for Mission Critical Application with the Navy:

- (1) All Department of the Navy refrigerant requirements for mission critical applications after 31 December 1994 will be supplied through the Department of Defense (DOD) ODS Reserve. Mission critical applications are defined as those uses of ODSs that impact combat mission capability, as determined by the Chief of Naval Operations. The DOD ODS Reserve is managed by the Defense Logistics Agency (DLA) and can only be accessed by Department of the Navy activities authorized by CNO.

TABLE B.1
LIST OF MISSION CRITICAL APPLICATIONS

Mission Critical Applications	ODS(s) Used
(1) Ship chilled water air conditioning and refrigeration, and environmental control systems in aircraft, and tactical ground combat vehicles.	CFC-11, CFC-12, CFC-500, CFC-114
(2) Flight line fire protection ship and shore based crash fire and rescue vehicles, and limited use for firefighter training.	Halon 1211
(3) Shipboard room flooding applications and explosion suppression and fire protection in aircraft, and in crew compartments of tactical ground combat vehicles and assault amphibious vehicles.	Halon 1301
(4) Manufacturing and maintenance of combat weapon and support systems where no compatible approved substitute exists, e.g., cleaning of gyroscopes and compressed oxygen systems.	CFC-113
(5) Shore-based HVAC&R equipment and fire protection systems directly supporting weapon delivery systems.	Various

- (2) All excess and recovered Class I ODSs and Halons will be deposited into the DOD ODS Reserve.

C. Recovery, Recycling, and Reclamation of ODSs:

- (1) As of 1 July 1992, it is illegal to intentionally release any Class I or Class II ODS refrigerant during the service, repair, or disposal of any appliance or industrial process. Technicians must take measures to capture and

contain any liquid or vapor whenever a refrigeration system is opened. De minimis releases associated with good faith attempts to recapture and recycle or safely dispose of Class I and Class II ODSs are not subject to the prohibition.

- (2) The Clean Air Act Amendments of 1990 required certification training of all air conditioning and refrigeration technicians by November 1994 on recycling/recovery of refrigerants. All Department of the Navy refrigerant technicians must receive EPA-approved training in the proper use of recovery and recycling equipment. Working on ODS equipment without certification is prohibited and illegal.
- (3) EPA-approved refrigerant recovery equipment will be used for all commercial off-the-shelf refrigerant equipment.
- (4) Intentional releases of Halon during the service, maintenance, repair, and disposal of any fire-fighting equipment are unlawful as of 14 November 1994.

2.0 INVENTORY AND PHASE-OUT PLAN OF ODS EQUIPMENT AT MAYPORT

2.1 Inventory of Air Conditioning Chiller Units Using Class I ODS Refrigerants

There are five air conditioning chiller units using Class I ODS refrigerants at NS Mayport. They are listed in Table B.2.

TABLE B.2
WATER CHILLER DESIGNATED FOR RETROFIT/REPLACEMENT

Unit	Bldg. #	Make & Model	Serial Number	Refrigerant	Capacity
1	338	Carrier 19DK5028AE	35726	CFC-11	170 tons
2	1363	Carrier 19DK55123AC	41653	CFC-11	148 tons
3	1363	Westinghouse PE200PE3196	T9009	CFC-12	200 tons
4	1388	Carrier 19DH5550CC	30573	CFC-11	200 tons
5	1555	Carrier 19DK5343CB	13736 1	CFC-11	202 tons

2.1.1 Phase-Out Options

- Unit 1: In good condition and will be retrofitted to use HCFC 123; can be expected to provide reliable service for at least 15 more years.
- Unit 2: In good condition and will be retrofitted to use HCFC-123; can be expected to provide reliable service for at least 15 more years.
- Unit 3: Is ~18 years old; retrofitting with HFC-134a will cost ~\$50,000; it has about 12 more years of service.
- Unit 4: In good condition and can be retrofitted to use HCFC-123; can be expected to provide reliable service for at least 15 more years.
- Unit 5: In good condition and can be retrofitted to use HCFC-123; can be expected to provide reliable service for at least 15 more years.

2.2 Inventory of Refrigeration Compressor Units Using Class I ODS Refrigerants

There are 17 refrigeration compressors using Class I ODS refrigerants at NS Mayport. They are listed in Table B.3.

TABLE B.3

REFRIGERATION COMPRESSORS REQUIRING REPLACEMENT

Building No.	Description	Make & Model	Serial No.	Refrigerant
338 Gallery	IOD Walk-in Freezer	Copeland		R-502
	Meat Prep	Copeland		CFC - 12
	Veg Prep	Copeland CBAM-0153-TAC-001		CFC - 12
	Thaw Box	Copeland		CFC - 12
	Chill Box #2	Copeland		CFC - 12
	Milk & Dairy Chill	Copeland		CFC - 12
243 Officers Club	Walk-in Freezer	Kramer T/TV-126	C55746	CFC - 12
	Beer Box	Kramer 086	C29628	CFC - 12
	Walk-in Chill	Kramer 0110	02986	CFC - 12
	Wine Cellar	Kramer		CFC - 12
242 CPO Club	Walk-in Chill	Kramer T/TV-126	C50855	CFC - 12
	Walk-in Chill	Peerless		CFC - 12
	Wine Cellar	Larkin Coil HT35	G67125	CFC - 12
	Beer Box	Kramer		CFC - 12
245 Sports Bar	Beer Cooler	Copeland CBAM-0123-TAC-030		CFC - 12
	Walk-in Freezer	Bally BF-100	98546	CFC - 12
	Walk-in Chill	Kramer C300	C406	CFC - 12

2.2.1 Phase-Out Options

2.2.1.1 Option 1

Retrofitting these units is relatively a simple process and the retrofit would cost ~\$200 per compressor. The process involves removing and containing the old refrigerant, removing the original mineral oil-base lubricant, replacing the lubricant with an alkyl benzene polyol ester-base lubricant, replacing filter-drier and sightglass, and then finally recharging the unit with one of several different refrigerant blends.

CFC-12 Units: The CFC-12 units can be recharged with a refrigerant blend, such as DuPont SUVA MP 39 (52% HCFC-22, 15% HFC-252a, 33% JCFC-124).

R-502 Units: The R-502 unit can be recharged with DuPont SUVA HP80 (38% HCFC-22, 60% HFC-125, 2% R-290).

2.2.1.2 Option 2

An economical analysis can be performed to determine if retrofitting would be cost-effective, if the age of each unit is known. Replacing each unit could cost between \$400 and \$800 per unit. It may be more economical to gradually replace all the refrigeration compressors than to retrofit.

2.3 Phase-out Plan for ODS Fire Suppressants

2.3.1 Phase Out of Halon 1301 Fixed System

NS Mayport has one two-bottle fixed 1301 Halon system located at Fleet Training Center, Building 1388. The alternative to the Halon system is a fixed CO₂ system. Because Building 1388 will no longer be in use after September 1995, the system will be secured and the bottles of Halon 1301 will be removed and sent to the DOD ODS Reserve.

2.3.2 Phase Out of Portable 1211 Fire Extinguishers

There are 70 (150 lbs. each) Halon 1211 portable extinguishers used for mission critical applications and will not be phased out until a suitable replacement has been identified. Sixty-seven extinguishers are kept at the HSL squadrons, along the flight line of the airfield. Three extinguishers are kept on aircraft refueling vehicles at the Mayport Fuel Farm.

There are approximately 1,500 Halon 1211 portable extinguishers (16 lbs. each) located throughout the Mayport Complex. These are scheduled to be replaced with ABC dry chemical extinguishers in early 1995.

3.0 PLAN OF ACTION AND MILESTONES FOR ODS PHASE-OUT AT NS MAYPORT

The plan of action and milestones (POA&M) for ODS phase-out at NS Mayport is listed below in Table B.4:

TABLE B.4
POA&M FOR ODS PHASE-OUT
NS Mayport

ODS Equipment (in Non-Mission Critical Applications)	Project Submission Date	Contract Aware Date	Contract Project Completion Date
Retrofit/Replace Air Conditioning Chiller Unit	18 May 1994	FY1995	FY1995/96
Retrofit/Replace Refrigerations Compressors	N/A	N/A	N/A
Remove/Replace Halon 1301 Fixed System with Portable CO2 Extinguishers	April 1995	FY1995	98% completed in April 1995
Halon 1211 Portable Fire Extinguishers (16 lb. units) With ABC Chemical Extinguishers	FY94	FY94	FY95

APPENDIX C OPPORTUNITY ASSESSMENT METHODOLOGY

SECTION 1 DATA COLLECTION METHODS

This section summarizes the methods used to collect data in the field and through subsequent activities for the Naval Station Mayport (NS Mayport) opportunity assessment. Included is an overview of the approach used, identification of resources that were made available (personnel and data), and a description of the documentation and methods employed to gather the data.

1.1 OVERVIEW OF APPROACH

The project planning and data collection tasks involved a number of subtasks including,

- Project Planning
 - Conducting an initial site visit,
 - Preparing a draft and final Work Plan,
 - Preparing a database structure,
- Data Collection
 - Telephoning points of contact (POCs) to schedule site visits and to discuss data needs.
 - Conducting a data collection team meeting,
 - Conducting a kick-off briefing,
 - Performing shop visits and interviews to collect data, and
 - Performing follow-up to collect missing data.

1.2 PROJECT PLANNING ACTIVITIES

An initial site visit to NS Mayport was conducted January 6 - 7, 1994. The purpose of the visit was to gather information to prepare the Work Plan for the opportunity assessment. A draft Work Plan detailing the proposed methodologies and project schedule was prepared in January

1994. The Navy personnel reviewed the draft Work Plan and comments were incorporated into the final Work Plan (February 1994) by Parsons ES.

The data collection effort was a joint effort between Parsons ES and the Navy. Three separate teams consisting of Parsons ES personnel and Navy personnel were created to conduct interviews at NAVAIR, NAVFAC, and NAVSEA facility processes. Organization POCs were contacted to set up interviews for data collection. Parsons ES created a database structure to standardize the data collection effort. A list of data collection team leaders and organizations visited by each team is presented in Table 1.1. Each organization was requested to make copies available of their material safety data sheets (MSDSs), internal hazardous waste manifests or logs, and any documentation of the quantity of hazardous materials used in their processes.

Because the data were to be collected on electronic clipboards (pen-activated computers), the clipboards were programmed and a database structure prepared to accept the data. Each set of blocks on the data collection worksheets were programmed to receive data. A database structure was then developed in ORACLE® that could accept data loaded from the electronic clipboard. The procedures associated with collecting the data on the electronic clipboards and uploading the data to the database structure are detailed in later sections.

The final pre-data collection activity was a meeting of Parsons ES and Navy team members to discuss the data collection logistics and methodologies. Methodology for data collection was explained in detail, and questions and concerns of team members were addressed. Also, logistics of the data collection effort and approach were discussed.

1.3 DESCRIPTION OF DATA COLLECTION WORKSHEETS

A set of five worksheets was used for the data collection process. The worksheet numbers and titles are:

- Worksheet 1 - Facility Information/Process Information
- Worksheet 2 - Input Material Information
- Worksheet 3 - Process Waste Information

Table 1.1

Worksheet 4 - Initial Process Flow Diagram

Worksheet 5 - Pollution Prevention Options and Other Notes

Worksheet 1 was used to collect basic qualitative and quantitative information about the process and the facility where it is located. A process identification number was assigned to the process on this worksheet. The process identification number consisted of ten characters. The first two letters were used to identify the organization, the middle six digits to identify the process type and sub-process, and the last two digits to identify the serial number of the process. A summary of the middle six digits of the process identification numbers and the process groups and subgroups they represent is presented in Table 1.2.

Input materials to the process were summarized on Worksheet 2. Worksheet 3 was used to record any wastes or emissions from the process. A waste stream code was assigned to every waste stream. A summary of waste stream codes is provided in Table 1.3. A process flow diagram was sketched on Worksheet 4 and any potential or completed P2 initiatives identified by the interviewee were recorded on Worksheet 5. Sample worksheets are presented in Appendix E.

1.4 SITE VISITS

The site visits were conducted by three teams during a one-week period. The site visits generally consisted of a process walk-through and an interview with a person knowledgeable about the process. Most of the industrial-type processes conducted by these organizations were recorded on the data collection worksheets. Field decisions were made, however, to exclude processes that used very small amounts of hazardous materials. Documents reviewed and collected during the site visits included MSDSs, internal hazardous waste manifests, material usage logs, permits, etc. Often the information collected during the site visit was compiled and added to the worksheets after completion of the interview.

1.5 DESCRIPTION OF INFORMATION RESOURCES AND DATA LIMITATIONS

Several information resources were used during the data collection process. The data collection team used data resources such as internal manifests documenting amounts of hazardous waste generated, computer printouts listing quantities of hazardous materials issued, etc. Typically, information not available included wastewater generation rates, air emission generation rates, process-specific quantities of hazardous materials used, etc. As written information was not always available, the interviewers often relied on interviewee estimates of material quantities.

TABLE 1.2
NAVY PROCESS CODES

Code	Class	Subclass	Name
CE-99-99	Clerical	NEC	NEC
CN-01-00	Construction	Structure Fabrication/Repair	Multiple Operations
CN-01-01	Construction	Structure Fabrication/Repair	Wharf Building
CN-01-02	Construction	Structure Fabrication/Repair	Ceiling Installation/Repair
CN-01-03	Construction	Structure Fabrication/Repair	Roofing Installation/Repair
CN-01-99	Construction	Structure Fabrication/Repair	NEC
CN-02-99	Construction	Electrical Installation/Repair	NEC
CN-03-00	Construction	Plastering and Related Tasks	Multiple Operations
CN-03-01	Construction	Plastering and Related Tasks	Drywall Installation
CN-03-99	Construction	Plastering and Related Tasks	NEC
CN-04-99	Construction	Plumbing Installation and Repair	NEC
CN-05-00	Construction	Structure Demolition	Multiple Operations
CN-05-01	Construction	Structure Demolition	Roof Removal
CN-05-02	Construction	Structure Demolition	Floor Tile Removal
CN-05-03	Construction	Structure Demolition	NEC
CN-06-99	Construction	Cementing and Related Tasks	NEC
CN-07-99	Construction	Excavating/Grading	NEC
CN-08-99	Construction	Paving	NEC
CN-09-99	Construction	NEC	NEC
ID-01-00	Industrial	Metal Cleaning-Mechanical	Multiple Operations
ID-01-01	Industrial	Metal Cleaning-Mechanical	Abrasive Blast-Hydro
ID-01-02	Industrial	Metal Cleaning-Mechanical	Abrasive Blast-Glass Bead
ID-01-03	Industrial	Metal Cleaning-Mechanical	Abrasive Blast - Mineral Grit
ID-01-04	Industrial	Metal Cleaning-Mechanical	Abrasive Blast - Sand
ID-01-05	Industrial	Metal Cleaning-Mechanical	Abrasive Blast - Shot
ID-01-06	Industrial	Metal Cleaning-Mechanical	Abrasive Blast - Organics
ID-01-07	Industrial	Metal Cleaning-Mechanical	Barrel Finishing
ID-01-08	Industrial	Metal Cleaning-Mechanical	Grinding
ID-01-09	Industrial	Metal Cleaning-Mechanical	Polishing and Buffing
ID-01-10	Industrial	Metal Cleaning-Mechanical	Wire Brushing
ID-01-11	Industrial	Metal Cleaning-Mechanical	Sanding
ID-01-12	Industrial	Metal Cleaning-Mechanical	Needlegunning
ID-01-13	Industrial	Metal Cleaning-Mechanical	Abrasive Blast Cleanup
ID-01-14	Industrial	Metal Cleaning-Mechanical	Abrasive Blast - Glove
ID-01-15	Industrial	Metal Cleaning-Mechanical	Hopper Tending
ID-01-16	Industrial	Metal Cleaning-Mechanical	Hot Work Helper/Firewatch
ID-01-99	Industrial	Metal Cleaning-Mechanical	NEC

TABLE 1.2 (CONTINUED)**NAVY PROCESS CODES**

Code	Class	Subclass	Name
ID-02-00	Industrial	Metal Cleaning-Chemical	Multiple Operations
ID-02-01	Industrial	Metal Cleaning-Chemical	Acid Cleaning - Bright Dip
ID-02-02	Industrial	Metal Cleaning-Chemical	Acid Cleaning - Pickling
ID-02-03	Industrial	Metal Cleaning-Chemical	Acid Cleaning - Descaling
ID-02-04	Industrial	Metal Cleaning-Chemical	Alkaline Cleaning - Descaling
ID-02-05	Industrial	Metal Cleaning-Chemical	Alkaline Cleaning - Etching
ID-02-06	Industrial	Metal Cleaning-Chemical	Degreasing - Wipe Cleaning
ID-02-07	Industrial	Metal Cleaning-Chemical	Degreasing - Dipping
ID-02-08	Industrial	Metal Cleaning-Chemical	Degreasing - Spray
ID-02-09	Industrial	Metal Cleaning-Chemical	Degreasing - Vapor
ID-02-10	Industrial	Metal Cleaning-Chemical	Degreasing - Emulsion
ID-02-11	Industrial	Metal Cleaning-Chemical	Acid Cleaning - Wipe
ID-02-12	Industrial	Metal Cleaning-Chemical	Acid Cleaning - Spray
ID-02-13	Industrial	Metal Cleaning-Chemical	Steam Cleaning
ID-02-14	Industrial	Metal Cleaning-Chemical	Chemical Paint Stripping
ID-02-15	Industrial	Metal Cleaning-Chemical	Gauge Cleaning
ID-02-99	Industrial	Metal Cleaning-Chemical	NEC
ID-03-00	Industrial	Metal Cleaning-Other	Multiple Operations
ID-03-01	Industrial	Metal Cleaning-Other	Ultrasonic Cleaning
ID-03-99	Industrial	Metal Cleaning-Other	NEC
ID-04-00	Industrial	Electroplating	Multiple Operations
ID-04-01	Industrial	Electroplating	Selective Plating
ID-04-02	Industrial	Electroplating	Open Tank
ID-04-03	Industrial	Electroplating	Vaporization
ID-04-99	Industrial	Electroplating	NEC
ID-05-00	Industrial	Painting	Multiple Operations
ID-05-01	Industrial	Painting	Spray - Compressed Air
ID-05-02	Industrial	Painting	Spray - Airless
ID-05-03	Industrial	Painting	Spray - Electrostatic
ID-05-04	Industrial	Painting	Powder Coating
ID-05-05	Industrial	Painting	Brush/Roller
ID-05-06	Industrial	Painting	DIP
ID-05-07	Industrial	Painting	Spray - Aerosol Can
ID-05-99	Industrial	Painting	NEC
ID-06-00	Industrial	Coating Operations	Multiple Operations
ID-06-01	Industrial	Coating Operations	Dip Coating
ID-06-02	Industrial	Coating Operations	Wipe Coating
ID-06-03	Industrial	Coating Operations	Brush/Roller Coating
ID-06-04	Industrial	Coating Operations	Spray Coating
ID-06-05	Industrial	Coating Operations	Tinning
ID-06-99	Industrial	Coating Operations	NEC

TABLE 1.2 (CONTINUED)**NAVY PROCESS CODES**

Code	Class	Subclass	Name
ID-07-00	Industrial	Metal Forming	Multiple Operations
ID-07-01	Industrial	Metal Forming	Forging
ID-07-02	Industrial	Metal Forming	Extrusion
ID-07-03	Industrial	Metal Forming	Bending/Forming
ID-07-04	Industrial	Metal Forming	Squeezing
ID-07-05	Industrial	Metal Forming	Drawing
ID-07-99	Industrial	Metal Forming	NEC
ID-08-00	Industrial	Heat Treating-Hardening	Multiple Operations
ID-08-01	Industrial	Heat Treating-Hardening	Carburizing
ID-08-02	Industrial	Heat Treating-Hardening	Cyaniding
ID-08-03	Industrial	Heat Treating-Hardening	Gas Nitriding
ID-08-04	Industrial	Heat Treating-Hardening	Annealing
ID-08-05	Industrial	Heat Treating-Hardening	Quenching
ID-08-99	Industrial	Heat Treating-Hardening	NEC
ID-09-00	Industrial	Foundry Operations	Multiple Operations
ID-09-01	Industrial	Foundry Operations	Molding - Green Sand
ID-09-02	Industrial	Foundry Operations	Molding - Shell
ID-09-03	Industrial	Foundry Operations	Molding - Investment Casting
ID-09-04	Industrial	Foundry Operations	Molding - Full Mold
ID-09-05	Industrial	Foundry Operations	Coremaking - Sodium Silicate
ID-09-06	Industrial	Foundry Operations	Coremaking - Hot Box System
ID-09-07	Industrial	Foundry Operations	Coremaking - No Bake
ID-09-08	Industrial	Foundry Operations	Coremaking - Shell
ID-09-09	Industrial	Foundry Operations	Casting - Furnace Melting
ID-09-10	Industrial	Foundry Operations	Casting - Open Hearth
ID-09-11	Industrial	Foundry Operations	Casting - Arc Furnace
ID-09-12	Industrial	Foundry Operations	Casting - Induction Furnace
ID-09-13	Industrial	Foundry Operations	Casting - Crucible Furnace
ID-09-14	Industrial	Foundry Operations	Casting - Cupola
ID-09-15	Industrial	Foundry Operations	Transfer - Pouring - Cooling
ID-09-16	Industrial	Foundry Operations	Shakeout
ID-09-17	Industrial	Foundry Operations	Cleaning and Finishing
ID-09-18	Industrial	Foundry Operations	Babbitting
ID-09-99	Industrial	Foundry Operations	NEC
ID-10-00	Industrial	Metal Machining	Multiple Operations
ID-10-01	Industrial	Metal Machining	Cutting
ID-10-02	Industrial	Metal Machining	Piercing or Punching
ID-10-03	Industrial	Metal Machining	Sawing
ID-10-04	Industrial	Metal Machining	Abrasive Grind
ID-10-05	Industrial	Metal Machining	Drilling and Boring
ID-10-06	Industrial	Metal Machining	Milling
ID-10-07	Industrial	Metal Machining	Turning
ID-10-08	Industrial	Metal Machining	Shaping and Slotting
ID-10-09	Industrial	Metal Machining	Riveting
ID-10-99	Industrial	Metal Machining	NEC

TABLE 1.2 (CONTINUED)
NAVY PROCESS CODES

Code	Class	Subclass	Name
ID-11-00	Industrial	Welding	Multiple Operations
ID-11-01	Industrial	Welding	Arc
ID-11-02	Industrial	Welding	Resistance
ID-11-03	Industrial	Welding	Oxy Fuel
ID-11-04	Industrial	Welding	Solid State
ID-11-05	Industrial	Welding	Brazing
ID-11-06	Industrial	Welding	Laser
ID-11-07	Industrial	Welding	Electron Beam
ID-11-08	Industrial	Welding	Shielded Metal Arc Welding
ID-11-09	Industrial	Welding	Gas Metal Arc Welding
ID-11-10	Industrial	Welding	Gas Tungsten Arc Welding
ID-11-11	Industrial	Welding	Plasma Arc
ID-11-12	Industrial	Welding	Air Carbon Arc
ID-11-13	Industrial	Welding	Electrical Soldering
ID-11-14	Industrial	Welding	Torch Soldering
ID-11-15	Industrial	Welding	Flux Core Process
ID-11-99	Industrial	Welding	NEC
ID-12-00	Industrial	Thermal Spraying	Multiple Operations
ID-12-01	Industrial	Thermal Spraying	Electric Arc
ID-12-02	Industrial	Thermal Spraying	Flame
ID-12-03	Industrial	Thermal Spraying	Plasma
ID-12-99	Industrial	Thermal Spraying	NEC
ID-13-00	Industrial	Cutting	Multiple Operations
ID-13-01	Industrial	Cutting	Thermal
ID-13-02	Industrial	Cutting	Oxygen
ID-13-03	Industrial	Cutting	Arc
ID-13-04	Industrial	Cutting	Electron Beam
ID-13-05	Industrial	Cutting	Laser
ID-13-06	Industrial	Cutting	Air Carbon Arc
ID-13-07	Industrial	Cutting	Plasma
ID-13-99	Industrial	Cutting	NEC
ID-14-00	Industrial	Non-Destructive Testing	Multiple Operations
ID-14-01	Industrial	Non-Destructive Testing	Visual
ID-14-02	Industrial	Non-Destructive Testing	Magnetic particle
ID-14-03	Industrial	Non-Destructive Testing	Liquid Penetrant
ID-14-04	Industrial	Non-Destructive Testing	Ultrasonic
ID-14-05	Industrial	Non-Destructive Testing	Acoustical Emission
ID-14-06	Industrial	Non-Destructive Testing	Radiographic
ID-14-07	Industrial	Non-Destructive Testing	Laser Inspection
ID-14-08	Industrial	Non-Destructive Testing	Weight Test
ID-14-99	Industrial	Non-Destructive Testing	NEC

TABLE 1.2 (CONTINUED)**NAVY PROCESS CODES**

Code	Class	Subclass	Name
ID-15-00	Industrial	Plastics/Rubber Processing	Multiple Operations
ID-15-01	Industrial	Plastics/Rubber Processing	Potting
ID-15-02	Industrial	Plastics/Rubber Processing	Depotting
ID-15-03	Industrial	Plastics/Rubber Processing	Molding
ID-15-04	Industrial	Plastics/Rubber Processing	Foaming
ID-15-05	Industrial	Plastics/Rubber Processing	Grinding
ID-15-06	Industrial	Plastics/Rubber Processing	Cutting
ID-15-07	Industrial	Plastics/Rubber Processing	Drilling
ID-15-08	Industrial	Plastics/Rubber Processing	Gluing
ID-15-09	Industrial	Plastics/Rubber Processing	Plastics/Rubber Mixing
ID-15-10	Industrial	Plastics/Rubber Processing	Helmet Pour
ID-15-11	Industrial	Plastics/Rubber Processing	Plaque Pour
ID-15-12	Industrial	Plastics/Rubber Processing	Sanding
ID-15-13	Industrial	Plastics/Rubber Processing	Polishing and Buffing
ID-15-14	Industrial	Plastics/Rubber Processing	Heat Sealing
ID-15-99	Industrial	Plastics/Rubber Processing	NEC
ID-16-00	Industrial	Man Made Fibers	Multiple Operations
ID-16-01	Industrial	Man Made Fibers	Hand Layup
ID-16-02	Industrial	Man Made Fibers	Spray Layup
ID-16-03	Industrial	Man Made Fibers	Grinding/Sanding
ID-16-04	Industrial	Man Made Fibers	Cutting
ID-16-05	Industrial	Man Made Fibers	Drilling
ID-16-99	Industrial	Man Made Fibers	NEC
ID-17-00	Industrial	Insulation - Asbestos	Multiple Operations
ID-17-01	Industrial	Insulation - Asbestos	Installation
ID-17-02	Industrial	Insulation - Asbestos	Containment Removal
ID-17-03	Industrial	Insulation - Asbestos	Fabrication
ID-17-04	Industrial	Insulation - Asbestos	Non-Containment Removal
ID-17-05	Industrial	Insulation - Asbestos	Glove Bag Removal
ID-17-06	Industrial	Insulation - Asbestos	Gasket Work
ID-17-07	Industrial	Insulation - Asbestos	Ambient Sampling
ID-17-99	Industrial	Insulation - Asbestos	NEC
ID-18-00	Industrial	Insulation - Man Made Fibers	Multiple Operations
ID-18-01	Industrial	Insulation - Man-made Fibers	Installation
ID-18-02	Industrial	Insulation - Man-made Fibers	Removal
ID-18-03	Industrial	Insulation - Man-made Fibers	Fabrication
ID-18-99	Industrial	Insulation - Man-made Fibers	NEC
ID-19-00	Industrial	Insulation - Other	Multiple Operations
ID-19-01	Industrial	Insulation - Other	Installation
ID-19-02	Industrial	Insulation - Other	Removal
ID-19-03	Industrial	Insulation - Other	Fabrication
ID-19-99	Industrial	Insulation - Other	NEC

TABLE 1.2 (CONTINUED)
NAVY PROCESS CODES

Code	Class	Subclass	Name
ID-20-00	Industrial	Woodworking	Multiple Operations
ID-20-01	Industrial	Woodworking	Cutting
ID-20-02	Industrial	Woodworking	Jointing
ID-20-03	Industrial	Woodworking	Drilling
ID-20-04	Industrial	Woodworking	Mortising/Routing
ID-20-05	Industrial	Woodworking	Turning Lathes
ID-20-06	Industrial	Woodworking	Sanding - Drum
ID-20-07	Industrial	Woodworking	Sanding - Disk
ID-20-08	Industrial	Woodworking	Sanding - Belt
ID-20-09	Industrial	Woodworking	Sanding - Hand
ID-20-10	Industrial	Woodworking	Preservative Application
ID-20-11	Industrial	Woodworking	Gluing
ID-20-12	Industrial	Woodworking	Staining
ID-20-13	Industrial	Woodworking	Transparent Finishes
ID-20-99	Industrial	Woodworking	NEC
ID-21-00	Industrial	Stone - Mineral Handling	Multiple Operations
ID-21-01	Industrial	Stone - Mineral Handling	Installation
ID-21-02	Industrial	Stone - Mineral Handling	Removal
ID-21-03	Industrial	Stone - Mineral Handling	Cutting
ID-21-04	Industrial	Stone - Mineral Handling	Drilling
ID-21-99	Industrial	Stone - Mineral Handling	NEC
ID-22-00	Industrial	Electronics Repair	Multiple Operations
ID-22-01	Industrial	Electronics Repair	Installation/Repair
ID-22-02	Industrial	Electronics Repair	Calibration - Manometric
ID-22-03	Industrial	Electronics Repair	Calibration - RFR Equipment
ID-22-99	Industrial	Electronics Repair	NEC
ID-23-00	Industrial	Equipment Repair	Multiple Operations
ID-23-01	Industrial	Equipment Repair	Hydraulic Repair
ID-23-02	Industrial	Equipment Repair	Generator Repair
ID-23-03	Industrial	Equipment Repair	Aircraft Engine Testing
ID-23-04	Industrial	Equipment Repair	Mechanical Assembly/Repair
ID-23-05	Industrial	Equipment Repair	Engine Accessory Testing
ID-23-06	Industrial	Equipment Repair	Brake/Gearbox Repair
ID-23-07	Industrial	Equipment Repair	Fuel Accessory Testing
ID-23-08	Industrial	Equipment Repair	Electrical Repair
ID-23-09	Industrial	Equipment Repair	Engine Test
ID-23-10	Industrial	Equipment Repair	Aircraft Engine Preservation
ID-23-99	Industrial	Equipment Repair	NEC
ID-24-00	Industrial	Chemical Processing	NEC
ID-25-00	Industrial	HM/HW Handling/Cleanup	Multiple Operations
ID-25-01	Industrial	HM/HW Handling/Cleanup	Ballast Installation
ID-25-02	Industrial	HM/HW Handling/Cleanup	Ballast Removal
ID-25-99	Industrial	HM/HW Handling/Cleanup	NEC

TABLE 1.2 (CONTINUED)**NAVY PROCESS CODES**

Code	Class	Subclass	Name
ID-99-99	Industrial	NEC	NEC
MD-01-00	Medical/Dental	Medical	Multiple Operations
MD-01-01	Medical/Dental	Medical	Sterilization
MD-01-02	Medical/Dental	Medical	Anesthetic Administration
MD-01-99	Medical/Dental	Medical	NEC
MD-02-00	Medical/Dental	Dental	Multiple Operations
MD-02-01	Medical/Dental	Dental	Prosthetics
MD-02-02	Medical/Dental	Dental	Sterilization
MD-02-03	Medical/Dental	Dental	Anesthetic Administration
MD-02-99	Medical/Dental	Dental	NEC
MD-99-99	Medical/Dental	NEC	
ML-01-00	Military Specific Operations	Weapons Handling	Multiple Operations
ML-01-01	Military Specific Operations	Weapons Handling	Firing Range Cleaning
ML-01-02	Military Specific Operations	Weapons Handling	Weapons Firing
ML-01-03	Military Specific Operations	Weapons Handling	Firing Range Supervision
ML-01-04	Military Specific Operations	Weapons Handling	Firing Range Pit Cleanup
ML-01-05	Military Specific Operations	Weapons Handling	Weapons Cleaning
ML-01-99	Military Specific Operations	Weapons Handling	NEC
ML-02-00	Military Specific Operations	Flight Line Operations	Multiple Operations
ML-02-01	Military Specific Operations	Flight Line Operations	Line Troubleshooting
ML-02-02	Military Specific Operations	Flight Line Operations	Aircraft Loading
ML-02-03	Military Specific Operations	Flight Line Operations	Launch and Recovery
ML-02-04	Military Specific Operations	Flight Line Operations	Fuel/Defuel Aircraft
ML-02-05	Military Specific Operations	Flight Line Operations	Liquid Oxygen Handling
ML-02-99	Military Specific Operations	Flight Line Operations	NEC
ML-99-99	Military Specific Operations	NEC	NEC
MS-01-00	Miscellaneous	Miscellaneous Operations	Multiple Operations
MS-01-01	Miscellaneous	Miscellaneous Operations	Equipment Monitoring
MS-01-02	Miscellaneous	Miscellaneous Operations	Machine Sewing
MS-01-03	Miscellaneous	Miscellaneous Operations	NEC
MS-99-99	Miscellaneous	NEC	NEC
PO-01-00	Professional/Tech and Management	Professional/Technical	Multiple Operations
PO-01-01	Professional/Tech and Management	Professional/Technical	Laboratory Chemical Analysis
PO-01-02	Professional/Tech and Management	Professional/Technical	Musical Performance
PO-01-03	Professional/Tech and Management	Professional/Technical	Computer Operations

TABLE 1.2 (CONTINUED)**NAVY PROCESS CODES**

Code	Class	Subclass	Name
PO-01-99	Professional/Tech and Management	Professional/Technical	NEC
PO-02-00	Professional/Tech and Management	Management	Multiple Operations
PO-02-01	Professional/Tech and Management	Management	Supervision
PO-02-99	Professional/Tech and Management	Management	NEC
PO-99-99	Professional/Tech and Management	Management	NEC
RD-99-99	Research and Development	NEC	NEC
SR-01-00	Service	Transportation	Multiple Operations
SR-01-01	Service	Transportation	Truck Operation
SR-01-02	Service	Transportation	Train Operation
SR-01-03	Service	Transportation	Tractor Trailer Operation
SR-01-04	Service	Transportation	Railroad Track Maintenance
SR-01-99	Service	Transportation	NEC
SR-02-00	Service	Motor Vehicle Maintenance	Multiple Operations
SR-02-01	Service	Motor Vehicle Maintenance	Motor Vehicle Testing
SR-02-02	Service	Motor Vehicle Maintenance	Motor Vehicle Repair Overhaul
SR-02-03	Service	Motor Vehicle Maintenance	Brake Work
SR-02-04	Service	Motor Vehicle Maintenance	Clutch Work
SR-02-05	Service	Motor Vehicle Maintenance	Body Work
SR-02-99	Service	Motor Vehicle Maintenance	NEC
SR-03-00	Service	Pest Control	Multiple Operations
SR-03-01	Service	Pest Control	Mixing
SR-03-02	Service	Pest Control	Pump Spray
SR-03-03	Service	Pest Control	Fogging
SR-03-04	Service	Pest Control	Fumigation
SR-03-99	Service	Pest Control	NEC
SR-04-00	Service	Building Maintenance	Multiple Operations
SR-04-01	Service	Building Maintenance	Sweeping
SR-04-02	Service	Building Maintenance	Air Conditioning/Refrigeration Charging
SR-04-99	Service	Building Maintenance	NEC
SR-05-00	Service	Grounds Maintenance	Multiple Operations
SR-05-01	Service	Grounds Maintenance	Street Sweeping
SR-05-02	Service	Grounds Maintenance	Lawn Maintenance
SR-05-99	Service	Grounds Maintenance	NEC
SR-06-99	Service	Protective Services-Fire	NEC

TABLE 1.2 (CONTINUED)**NAVY PROCESS CODES**

Code	Class	Subclass	Name
SR-07-00	Service	Protective Services-Security	Multiple Operations
SR-07-01	Service	Protective Services-Security	Firing Range Cleaning
SR-07-02	Service	Protective Services-Security	Weapons Firing
SR-07-03	Service	Protective Services-Security	Firing Range Supervision
SR-07-04	Service	Protective Services-Security	Firing Range Pit Cleanup
SR-07-05	Service	Protective Services-Security	Weapons Cleaning
SR-07-06	Service	Protective Services-Security	Document Shredding
SR-07-99	Service	Protective Services-Security	NEC
SR-08-00	Service	Graphic Arts	Multiple Operations
SR-08-01	Service	Graphic Arts	Silk Screening
SR-08-02	Service	Graphic Arts	Photography Development
SR-08-03	Service	Graphic Arts	Photography Chemical Mixing
SR-08-04	Service	Graphic Arts	Photography Equipment Cleaning
SR-08-99	Service	Graphic Arts	NEC
SR-09-99	Service	Recreation	NEC
SR-10-00	Service	Production/Distribution of Utilities	Multiple Operations
SR-10-01	Service	Production/Distribution of Utilities	Compressed Air
SR-10-02	Service	Production/Distribution of Utilities	Boiler Cleaning
SR-10-03	Service	Production/Distribution of Utilities	Boiler Repair
SR-10-04	Service	Production/Distribution of Utilities	Equipment Monitoring
SR-10-05	Service	Production/Distribution of Utilities	Transformer Repair and Maintenance
SR-10-06	Service	Production/Distribution of Utilities	Ship to Shore Connection
SR-10-07	Service	Production/Distribution of Utilities	ESP Maintenance/Cleaning
SR-10-99	Service	Production/Distribution of Utilities	NEC
SR-11-00	Service	Supply and Materials Handling	Multiple Operations
SR-11-01	Service	Supply and Materials Handling	Foam in Place Packaging
SR-11-02	Service	Supply and Materials Handling	Material Handling Equipment Operation
SR-11-03	Service	Supply and Materials Handling	Tool and Parts Issue
SR-11-04	Service	Supply and Materials Handling	Crane Operation
SR-11-99	Service	Supply and Materials Handling	NEC
SR-12-00	Service	Printing/Reproduction	Multiple Operations
SR-12-01	Service	Printing/Reproduction	Diazo Printing
SR-12-02	Service	Printing/Reproduction	Document Preparation
SR-12-03	Service	Printing/Reproduction	Reproduction Equipment Cleaning
SR-12-04	Service	Printing/Reproduction	Offset Printing
SR-12-05	Service	Printing/Reproduction	Engraving
SR-12-99	Service	Printing/Reproduction	NEC
SR-13-00	Service	Communications	Multiple Operations
SR-13-01	Service	Communications	Teletype Operations
SR-13-99	Service	Communications	NEC

TABLE 1.2 (CONTINUED)
NAVY PROCESS CODES

Code	Class	Subclass	Name
SR-14-99	Service	Food Preparation and Handling	NEC
SR-15-99	Service	HW/Sewer Treatment	NEC
SR-16-99	Service	Water Treatment	NEC
SR-99-99	Service	NEC	NEC

NEC Not elsewhere classified

TABLE 1.3
WASTE STREAM CODES

Waste Stream Code Number	Waste Stream Description	Physical State⁽¹⁾
01	Abrasive Blast Residue (Paint Chips and Media)	S
02	Used Batteries	S
03	Used Battery Acid	L
04	Used Chemical Paint Stripper	L
05	Chemical Paint Stripper Sludge	SS
06	Plating Bath Sludges	SS
07	Used Maskants	S
08	Used Oil (including Turbine Oil, Lube Oil, Hydraulic Fluid, Brake Fluid)	L
09	Drained Fuel	L
10	Used Antifreeze	L
11	Used Oil Contaminated with Purging Fluids/Solvents	L
12	Fuel Contaminated with Purging Fluids/Solvents	L
13	Used Machine Coolant	L
14	Metal Shavings/Residue	S
15	Used NDI Penetrant/Developer/Emulsifier Solutions	L
16	Waste Paint Remnants	S
17	Paint Waste with Cleanup Solvents	L
18	Water Wall Paint Booth Sludges	SS
19	Partially Filled Aerosol Cans	S
20	Used Fixer/Developer	L
21	Used Cleaning Solvent	L
22	Used Cleaning Solvent - Petroleum-Based	L
23	Used Cleaner - Aqueous-Based	L
24	Used Rags	S
25	Used Filters	S
26	Used Absorbents	S
27	Used Solid Rocket Fuel	S
28	Bottoms From Recycling/Distillation Processes	SS
29	Degreaser Sludges	SS
30	Laboratory Testing Chemicals/Reagents	L
31	Wastewater from Paint Spray Booth	L
32	Wastewater from Printed Circuit Board Manufacturer	L
33	Wastewater from Aircraft/Vehicle Cleaning Operations	L
34	Wastewater from Electroplating Rinses	L
35	Wastewater from Electroplating Bath Dumps	L
36	Wastewater from Photography Shop	L
37	Wastewater from NDI Shop	L
38	Wastewater from Other Rinsing Operations	L
39	Waste Cooling Water	L
40	Other Wastewater	L
41	Stack-VOC Emissions	G
42	Stack-Particulate Emissions	G
43	Fugitive - VOC Emissions	G
44	Fugitive - Other Emissions	G

TABLE 1-3
WASTE STREAM CODES
(CONTINUED)

Waste Stream Code Number	Waste Stream Description	Physical State⁽¹⁾
45	Adhesives	S
46	Used Cutting Oil	L
47	Herbicides/Pesticides/Insecticides/Rodenticides	S, L
48	Hydrazine Waste	L
49	Other Sludge	SS
50	Spent Solder Flux/Paste	S
51	Cement/Concrete Sealer/Sealing Comp	S
52	Dyes/Inks/Toner	L
53	Empty Container with Residue	S
54	Fire Fighting Chemicals	S, L
55	Light Bulbs	S
56	Oxidizer Wastes	L
57	PCB Containing Material	S, L
58	Refrigerant	G
59	Silver Containing Paper	S
60	Corrosion Inhibitor	L
61	Descaler	L
62	Expired Shelf Life Material	S, L, G
63	Unused Hazardous Material	S, L, G
64	Stopbath Solution	L
65	Used Bleach	L
66	Used Activator	L

(1) S = Solid, L = Liquid, SS = Semi-Solid, G = Gas

SECTION 2

DATA COMPILATION METHODS

2.1 OVERVIEW OF APPROACH

The data reduction task involved uploading to the database data collected during the site visits; revising and adding to the field collected data (based on other data sources and the results of a quality control [QC] check); performing a materials accounting and mass balance estimate of the target compounds for this study; preparing process flow diagrams; and prioritizing the processes. These steps and the worksheets used to accomplish them are described in the following sections.

2.2 DESCRIPTION OF DATA COMPILATION WORKSHEETS

Worksheets 6 and 7 were used for the data compilation process. Appendix E contains an example set of these worksheets. A description of how each worksheet was used is described in the following subsections. The worksheet numbers and titles are:

Worksheet 6 - Process Site Accounting Summary

Worksheet 7 - Final Process Flow Diagram

2.3 DATA REDUCTION/DATABASE FORMATION

Following the process site visits, data collected on the electronic clipboard were uploaded into the ORACLE® database. Three reports in table format were developed based only on the information collected on Worksheets 1, 2, & 3 (information report, material report, and waste report). These reports were reviewed for accuracy and completeness. Any revisions/additions to the reports were marked directly on the table and returned to the database manager. The database manager updated the database based on the corrections and generated final reports. These reports are presented as Appendix F.

2.4 DATABASE DEVELOPMENT

The database was further developed by creating a hazardous material table by listing the National Stock Number (NSN) items purchased through the Naval Supply Center. Material Safety Data Sheets (MSDSs) for the NSN items were printed out from the Hazardous Material Information System (HMIS) August 1993 version. Manufacturer's cage numbers for each item were identified and included in the database to replace manufacturer's name. Hard copies of manufacturer MSDSs for non-NSN (open purchase) items were obtained from interviewees during the site visits or directly from manufacturers. These MSDSs were assigned a dummy NSN number, which was included in the database to make the database format consistent. The MSDSs were used to obtain information about the composition of the items, including percentage of target compounds, specific gravity and vapor pressure.

The target compound list provided by the Navy consisted of 320 compounds targeted for reduction. This list was modified to include ozone depleting substances and EPA 17 compounds which were not included in the original list. The updated list consists of 350 compounds and is presented in Table 2.1.

The information obtained from MSDSs; percentage of target compounds and specific gravity of the material was inputted in the database. A target compound report listing target compounds and its percentage in each of the process materials used at NS Mayport is presented in Appendix G. A group letter for each material was included. A group letter corresponds to one of the nine group categories as shown on Table 2.2. A group report showing the assigned group for each process material used at NS Mayport is presented in Appendix G. A summary of the quantity of hazardous material usage by process and its group is presented in Appendix H, subdivided by organization. The hazardous materials table was then linked to the process material table to calculate pounds of target compounds (if any) in each hazardous material used by processes.

After all the information was compiled into a database, the quantity of hazardous materials used, hazardous waste generated, and target chemicals used were calculated. This calculation is based on the amount of material used by a process, the specific gravity of the material, and the percentage of the target compound(s) contained in the material. An example

TABLE C2.1

LIST OF TARGET COMPOUNDS NS MAYPORT, FL

1,1,1-TRICHLOROETHANE	DICHLOROHEXAFLUOROPROPANE (CFC-216)*
1,1,2,2-TETRACHLOROETHANE	DICHLOROMETHANE (METHYLENE CHLORIDE)
1,1,2-TRICHLOROETHANE	DICHLOROTETRAFLUOROETHANE (CFC-114)
1,1-DICHLOROETHANE	DICHLOROTRIFLUOROETHANE (HCFC-123)*
1,1-DIMETHYL HYDRAZINE	DICHLORVOS
1,2,4-TRICHLOROBENZENE	DICOFOL
1,2,4-TRIMETHYLBENZENE	DIEPOXYBUTANE
1,2-DIBROMO-3-CHLOROPROPANE	DIETHANOLAMINE
1,2-DIBROMOETHANE	DIETHYL PHTHALATE
1,2-DICHLOROBENZENE	DIETHYL SULFATE
1,2-DICHLOROETHANE	DIMETHYL FORMAMIDE
1,2-DICHLOROETHYLENE	DIMETHYL PHTHALATE
1,2-DICHLOROPROPANE	DIMETHYL SULFATE
1,2-DIPHENYLHYDRAZINE	DIMETHYLCARBAMYL CHLORIDE
1,2-EPOXYBUTANE	DINITROTOLUENE
1,2-PROPYLENEIMINE	EPICHLOROHYDRIN
1,3-BUTADIENE	ETHYL ACRYLATE
1,3-DICHLOROBENZENE	ETHYL CHLOROFORMATE
1,3-DICHLOROPROPYLENE	ETHYLBENZENE
1,4-DICHLOROBENZENE	ETHYLENE
1,4-DIOXANE	ETHYLENE GLYCOL
1-AMINO-2-METHYLANTHRAQUINONE	ETHYLENE OXIDE
2,2,4-TRIMETHYLPENTANE	ETHYLENE THIOUREA
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	ETHYLENIMINE
2,3-DICHLOROPROPENE	FLUOMENTURON
2,4,5-TRICHLOROPHENOL	FORMALDEHYDE
2,4,6-TRICHLOROPHENOL	FREON 113
2,4-D, SALTS AND ESTERS	HEPTACHLOR
2,4-DIAMINOANISOLE	HEPTACHLOROFLUOROPROPANE (CFC-211)*
2,4-DIAMINOANISOLE SULFATE	HEXACHLORO-1,3-BUTADIENE
2,4-DIAMINOTOLUENE	HEXACHLOROBENZENE
2,4-DICHLOROPHENOL	HEXACHLOROCYCLOPENTADIENE
2,4-DIMETHYLPHENOL	HEXACHLORODIFLUOROPROPANE (CFC-212)*
2,4-DINITROPHENOL	HEXACHLOROETHANE
2,4-DINITROTOLUENE	HEXACHLORONAPHTHALENE
2,6-DINITROTOLUENE	HEXAMETHYLENE-1,6-DIISOCYANATE
2,6-XYLIDINE	HEXAMETHYLPHOSPHORAMIDE
2-AMINOANTHRAQUINONE	HEXANE
2-CHLOROACETOPHENONE	HYDRAZINE
2-ETHOXYETHANOL	HYDRAZINE SULFATE
2-METHOXYETHANOL	HYDROCHLORIC ACID
2-NITROPHENOL	HYDROGEN CYANIDE
2-NITROPROPANE	HYDROGEN FLUORIDE
2-PHENYLPHENOL	HYDROGEN SULFIDE
3,3-DICHLOROBENZIDINE	HYDROQUINONE
3,3-DIMETHOXYBENZIDINE	ISOBUTYRALDEHYDE
3,3-DIMETHYLBENZIDINE	ISOSAFROLE
4,4-DIAMINODIPHENYL ETHER	LEAD AND COMPOUNDS*
4,4-METHYLENEBIS	LIDANE
4,4-METHYLENEBIS(N,N-DIMETHYL)	M-CRESOL
4,4-METHYLENEDIANILINE	M-DINITROBENZENE
4,4-THIODIANILINE	M-XYLENE
4,6-DINITRO-O-CRESOL	MALEIC ANHYDRIDE
4,4-ISOPROPYLDENEDIPHENOL	MANEB
4-AMINOAZOBENZENE	MANGANESE
4-AMINOBIPHENYL	MERCURY AND COMPOUNDS*
4-DIMETHYLAMINOAZOBENZENE	METHANOL
4-NITROBIPHENYL	METHOXYCHLOR
4-NITROPHENOL	METHYL ACRYLATE
5-NITRO-O-ANISIDINE	METHYL ETHYL KETONE
ACETALDEHYDE	METHYL HYDRAZINE
ACETAMIDE	METHYL IODIDE
ACETONE	METHYL ISOBUTYL KETONE
ACETONITRILE	METHYL ISOCYANATE
ACETYLAMINOFLUORINE	METHYL METHACRYLATE

TABLE C2.1

LIST OF TARGET COMPOUNDS NS MAYPORT, FL

ACROLEIN	METHYL TERT-BUTYL ETHER
ACRYLAMIDE	METHYLENE BROMIDE
ACRYLIC ACID	METHYLENE DIPHENYL DIISOCYANATE
ACRYLONITRILE	MICHLER'S KETONE
ALDRIN	MOLYBDENUM TRIOXIDE
ALLYL ALCOHOL	MUSTARD GAS
ALLYL CHLORIDE	N,N-DIETHYL ANILINE
ALPHA-NAPHTHYLAMINE	N-BUTYL ALCOHOL
ALUMINUM	N-DIOCTYL PHTHALATE
ALUMINUM OXIDE	N-NITROSO-N-ETHYLUREA
AMMONIA	N-NITROSO-N-METHYLUREA
AMMONIUM NITRATE	N-NITROSODI-N-BUTYLAMINE
AMMONIUM SULFATE	N-NITROSODI-N-PROPYLAMINE
ANILINE	N-NITROSODIETHYLAMINE
ANTHRACENE	N-NITROSODIMETHYLAMINE
ANTIMONY	N-NITROSODIPHENYLAMINE
ARSENIC	N-NITROSOMETHYL VINYLAMINE
ASBESTOS	N-NITROSOMORPHOLINE
BARIUM	N-NITROSONORNICOTINE
BENZAL CHLORIDE	N-NITROSOPIPERIDINE
BENZAMIDE	NAPHTHALENE
BENZENE	NAPHTHYLAMINE
BENZIDINE	NICKEL AND COMPOUNDS*
BENZOIC TRICHLORIDE	NITRIC ACID
BENZOYL CHLORIDE	NITRILOTRIACETIC ACID
BENZOYL PEROXIDE	NITROBENZENE
BENZYL CHLORIDE	NITROGEN
BERYLLIUM	NITROGEN MUSTARD
BETA-NAPHTHYLAMINE	NITROGLYCERIN
BETA-PROPIOLACTONE	O-ANISIDINE
BIPHENYL	O-ANISIDINE HYDROCHLORIDE
BIS(2-CHLORO-1-METHYLETHYL) ETHER	O-CRESOL
BIS(2-CHLOROETHYL) ETHER	O-DINITROBENZENE
BIS(2-ETHYLHEXYL) ADIPATE	O-TOLUIDINE
BIS(2-ETHYLHEXYL) PHTHALATE (DEHP)	O-TOLUIDINE HYDROCHLORIDE
BIS(CHLOROMETHYL) ETHER	O-XYLENE
BROMOCHLORODIFLUOROMETHANE (HALON 1211)	OCTACHLORONAPHTHALENE
BROMOFORM	OSMIUM TETROXIDE
BROMOMETHANE	P-ANISIDINE
BROMOTRIFLUOROMETHANE (HALON 1301)	P-CRESIDINE
BUTYL ACRYLATE	P-CRESOL
BUTYL BENZYL PHTHALATE	P-DINITROBENZENE
BUTYRALDEHYDE	P-NITROSODIPHENYLAMINE
C.I. ACID GREEN 3	P-PHENYLENEDIAMINE
C.I. BASIC GREEN 4	P-XYLENE
C.I. BASIC RED 1	PARATHION
C.I. DIRECT BLACK 38	PENTACHLOROFLUOROETHANE (CFC-111)*
C.I. DIRECT BLUE 6	PENTACHLOROPHENOL
C.I. DIRECT BROWN 95	PENTACHLOROTRIFLUOROPROPANE (CFC-213)*
C.I. DISPERSE YELLOW 3	PERACETIC ACID
C.I. FOOD RED 15	PHENOL
C.I. FOOD RED 5	PHOSGENE
C.I. SOLVENT ORANGE 7	PHOSPHINE
C.I. SOLVENT YELLOW 14	PHOSPHORIC ACID
C.I. SOLVENT YELLOW 3	PHOSPHORUS (YELLOW OR WHITE)
C.I. SOLVENT YELLOW 34	PHTHALIC ANHYDRIDE
C.I. VAT YELLOW 4	PICRIC ACID
CADMIUM AND COMPOUNDS*	POLYCHLORINATED BIPHENYLS
CALCIUM CYANAMIDE	PROPANE SULFONE
CAPROLACTAM	PROPIONALDEHYDE
CAPTAN	PROPOXUR
CARBARYL	PROPYLENE
CARBON DISULFIDE	PROPYLENE OXIDE
CARBON TETRACHLORIDE	PYRIDINE
CARBONYL SULFIDE	QUINOLINE

TABLE C2.1

LIST OF TARGET COMPOUNDS NS MAYPORT, FL

CATECHOL	QUINONE
CHLORAMBEN	QUINTOBENZENE
CHLORDANE	SACCHARIN
CHLORINE	SAFROL
CHLORINE DIOXIDE	SEC-BUTYL ALCOHOL
CHLOROACETIC ACID	SELENIUM
CHLOROBENZENE	SILVER
CHLOROBENZILATE	STYRENE
CHLORODIFLUOROETHANE (HCFC-142)*	STYRENE OXIDE
CHLORODIFLUOROMETHANE (HCFC-22)*	SULFURIC ACID
CHLOROETHANE	TERT-BUTYL ALCOHOL
CHLOROFORM	TETRACHLORODIFLUOROETHANE (CFC-112)*
CHLOROHEPTAFLUOROPROPANE (CFC-217)*	TETRACHLOROETHYLENE
CHLOROMETHANE	TETRACHLOROFLUOROETHANE (HCFC-121)*
CHLOROMETHYL METHYL ETHER	TETRACHLOROTETRAFLUOROPROPANE (CFC-214)*
CHLOROPENTAFLUOROETHANE (CFC-115)*	TETRACHLORVINPHOS
CHLOROPRENE	THALLIUM
CHLOROTETRAFLUOROETHANE (HCFC-124)*	THIOACETAMINE
CHLOROTHALONIL	THIOUREA
CHLOROTRIFLUOROETHANE (HCFC-133)*	THORIUM DIOXIDE
CHLOROTRIFLUOROMETHANE (CFC-13)*	TITANIUM TETRACHLORIDE
CHROMIUM AND COMPOUNDS*	TOLUENE
COBALT	TOLUENE-2,4-DIISOCYANATE
COPPER	TOLUENE-2,6-DIISOCYANATE
CREOSOTE	TOLUENEDIISOCYANATE
CRESOL	TOXAPHENE
CUMENE	TRIAZQUONE
CUMENE HYDROPEROXIDE	TRICHLORFON
CUPFERRON	TRICHLORODIFLUOROETHANE (HCFC-122)*
CYANIDES*	TRICHLOROETHYLENE*
CYCLOHEXANE	TRICHLOROFLUOROETHANE (HCFC-131)*
DDE	TRICHLOROFLUOROMETHANE (CFC-11)
DECABROMODIPHENYL OXIDE	TRICHLOROPENTAFLUOROPROPANE (CFC-215)*
DIALATE	TRICHLOROTRIFLUOROETHANE (CFC-113)*
DIAMINOTOLUENE	TRIFLURALINE
DIAZOMETHANE	TRIS(2,3-DIBROMOPROPYL) PHOSPATE
DIBENZOFURAN	URETHANE
DIBROMOTETRAFLUOROETHANE (HALON 2402)	VANADIUM (FUME OR DUST)
DIBUTYL PHTHALATE	VINYL ACETATE
DICHLOROBENZENE	VINYL BROMIDE
DICHLOROBROMOMETHANE	VINYL CHLORIDE
DICHLORODIFLUOROETHANE (HCFC-132)*	VINYLDENE CHLORIDE
DICHLORODIFLUOROMETHANE (CFC-12)	XYLENE (MIXED ISOMERS)
DICHLOROFLUOROETHANE (HCFC-141)*	ZINC (FUME OR DUST)
DICHLOROFLUOROMETHANE (HCFC-21)*	ZINEB

calculation for calculating the pounds of toluene, from an acrylic enamel paint used in a vehicle paint booth operation is shown below.

$$TC = HM \times SG \times 8.34 \times \% TC$$

$$308 \text{ lb/yr Toluene} = (150 \text{ gal/yr Acrylic Enamel}) \times (1.1) \times (8.34 \text{ lb/gal}) \times (22\% \text{ Toluene})$$

Where:

TC	=	Target Compound, lbs/yr
HM	=	Hazardous Material, gal/yr
SG	=	Specific Gravity, dimensionless
8.34	=	Average density of water in lb/gal from 0°C to 45°C
% TC	=	Weight Percent of Target Compound in Hazardous Material

2.5 MATERIALS ACCOUNTING AND PROCESS FLOW DIAGRAM PROCEDURES

A materials accounting report in the format of Worksheet 6 was generated for each process site. A copy of the final materials accounting reports are presented in Appendix I. The purpose of materials accounting is to quantify the process influents and effluents on a macroscopic, gross-weight basis. Hazardous material inputs to a process are listed on the left side of the materials accounting report. On the right side of the report, wastes generated by the process are listed. The gross input weights of materials were compared with the output weights of wastes (to all media) to determine if significant discrepancies existed and then to account for them. Examples of inputs that are not necessarily accounted for during data collection include paint on parts being stripped and grime on parts being cleaned. An example of an output not previously accounted for includes fugitive emissions. Any required input or output changes were added to the materials accounting report, and the data for the process site were updated with the new or corrected information.

A material balance of the waste streams was estimated during the materials accounting procedure to assess their environmental fate in the process. The six fate categories used for this project are hazardous waste, air emission, wastewater, solid waste, consumed in process, and recycle. A summary of waste streams' fate calculations is presented in Appendix J, subdivided

by organization. A material balance of each of the target compounds used and released for every process was also performed. The results are presented in Appendix K..

Representative process flow diagrams (PFDs) were completed for general process groups such as painting operations, degreasing\cleaning operations, etc. The representative PFDs include all known variations of processes that were visited during the effort for each general process group, including new materials\wastes information that was determined from the materials accounting. In general, the part, vehicle, etc., being processed is shown entering the process at the left and exiting the process on the right. Materials required by the process (e.g., solvents, rags, etc.) are shown entering the process at the top. Hazardous or nonhazardous waste, wastewater, or off-site recycled waste generated by the process is shown exiting at the bottom. Air emissions are shown exiting the process at the top. Any in-process recycle streams are shown re-entering the process at the left.

2.6 PROCESS PRIORITIZATION PROCEDURES

Once the material accounting was complete and the database updated, the processes were prioritized for further evaluation. The prioritization was based on annual hazardous waste generation and annual target chemical usage. The processes were sorted based on amount of target compounds used and hazardous waste generated in descending order. The top one third of the processes from both lists were targeted for further P2 evaluation, and representative processes were selected from this group. Some processes not in the top one-third were selected for inclusion as a representative process on a case by case basis.

SECTION 3

TECHNICAL OPTIONS EVALUATION AND ECONOMIC ANALYSIS

3.1 OVERVIEW OF APPROACH

A set of three worksheets was used for evaluation of technical options. A set of two worksheets was used to conduct an economic analysis of the options found to be technically feasible. A description of how each worksheet was used is provided in the following subsections. The worksheet numbers and titles for technical feasibility worksheets are:

Worksheet 9 - Opportunity Identification
Worksheet 10 - Option Description
Worksheet 11 - Technical Feasibility Evaluation

The worksheet numbers and titles for economic analysis worksheets are:

Worksheet 12 - Option Cost Identification
Worksheet 13 - Determination of Differential Investment and Operating Costs.

All sample worksheets are presented in Appendix E.

3.2 TECHNICAL OPTIONS EVALUATION METHODS

After determination of the origins and causes of waste generation a comprehensive set of P2 options were identified and evaluated for each process group. Each option, if implemented, should reduce hazardous materials usage, hazardous/solid waste generation, air emissions, wastewater, and/or worker health risks. Worksheets 9 through 11 were completed for the technical options evaluation task.

The technical options evaluation was initiated by generating and recording technical options on Worksheet 9 regardless of technical feasibility or cost. Options were identified during two stages in the assessment:

1. During Data Collection: The field team members solicited ideas from the Navy personnel during the process site visits. These ideas, as well as any P2 options implemented or planned to be implemented at the base, were recorded on Worksheet 5.
2. Computer Databases, Literature Reviews, and/or Vendor Consultations: Technical options were also identified for each process group or for a particular process site by reviewing automated clearinghouse data such as EPA's Pollution Prevention Information Exchange System (PIES), reviewing literature, and consulting vendors and manufacturers.

Options identified on Worksheet 9 were evaluated more thoroughly using Worksheets 10 and 11. Worksheet 10 was used to record a basic description and definition of each option and to further develop and address considerations for each option. At this stage the option type (source reduction, recycling, treatment, and disposal) was identified. Worksheet 10 was completed for a particular process site or for a process group.

Worksheet 11, Technical Feasibility Evaluation, was used to identify specific aspects that might render an option technically infeasible or that might raise issues not otherwise considered. The criteria used to evaluate the technical feasibility of each option include:

- Commercial Demonstration and Availability
- Safety/Industrial Hygiene Concerns
- Space/Utility Limitations
- Increased Expertise/Training Requirements
- Compliance Issues
- Compatibility

If the answer to any question on Worksheet 11 was affirmative, the option was not disqualified; however, the number and magnitude of potential obstacles may have made the option impractical, or technically infeasible, in other words. If an option was determined to be technically infeasible while completing this worksheet, an economic evaluation was not performed. Technical Feasibility evaluation results including all worksheets and economic analysis worksheets are presented in Appendix L. Technically feasible options were screened resulting in a priority list of options for which economic analyses were performed. The qualitative screening procedure included such factors as the option type, the potential reduction in waste generation/hazardous material usage, and the estimated capital costs.

3.3 ECONOMIC ANALYSIS METHODS

Options were evaluated for economic feasibility following the technical options feasibility evaluation. Worksheets 12 and 13 were completed for the economic analysis.

Worksheet 12 was used to identify cost factors such as process equipment, training, and site preparation. Assumptions and other background information used as a basis for the costs on Worksheet 13 were recorded on Worksheet 12.

Worksheet 13 was used to calculate the monetary costs and benefits (savings) of an option and to compute a differential cost by comparing costs/benefits with the status quo operation. Figure 3.1 is an example of a completed Worksheet 13; an explanation is provided in Table 3.1.

The economic analysis procedure included identifying applicable cost elements, calculating differential costs/savings, calculating the payback period and net present value. The economic analysis followed guidelines in the Navy P2 guidance document. Table 3.2 is a list of the general assumptions used for completing these analyses. Solid waste collection, transportation and tipping fee was not used in these analysis; hence some options may appear economically more attractive.

Identified options and associated costs were assumed to be stable for the purpose of this analysis. Potential impact of future cost changes was not analyzed.

Figure 3.1

TABLE 3.1
EXPLANATION OF WORKSHEET 13
ENTRIES AND CALCULATIONS
NS MAYPORT, FL

Assigned Number	Column or Row Title	Explanation
1	Status Quo Operational Cost	Operating costs for the existing operation. Operating costs are on an annual basis. Costs are shown as a positive value.
2	Option Investment Costs	Capital costs required to purchase equipment, train personnel, etc. Costs are shown as a positive value. The differential savings are the negative value of the investment cost.
3	Option Operating Costs	Annual operating costs of implementation. A positive value indicates a cost. The differential savings are the operating costs subtracted from the status quo operating cost. A positive differential savings value indicates an annual cost savings.
4	% of Cost	The percentage of the total present worth contributed by each cost element. Value used to determine which parameters should be varied in a sensitivity analysis.
5	Total Investment Cost	Total capital required for implementation (shown as a negative number).
6	Total Net Annual Operating Costs/Savings	Total annual savings/costs of implementation. Positive value indicates an annual savings. Negative value indicates an annual additional cost to the status quo.
7	Payback Period (Years)	The total investment cost (5) divided by the total net annual operating costs savings (6) calculates the number of years required to recoup initial investment cost.
8	Net Present Value of Benefits and Investment	The present value of the total net annual operating costs savings (6) over the economic life minus the total investment cost (5). A positive value indicates a cost savings .

TABLE 3.2
GENERAL ASSUMPTIONS USED IN
COMPLETING ECONOMIC ANALYSES
NS MAPORT, FL

1. Net present-worth analysis (based on the differential costs between the status quo and the option) was used for comparing options.
2. Mid-year cost factors were used for the present-worth analysis.
3. The discount rate of 7 percent was used.
4. The economic life is equal to the physical or technological life. Therefore, no (or nil) salvage value was assumed at the end of the economic life.
5. The payback period for each process was calculated by dividing the total investment cost by the net annual savings.
6. An average loaded salary of \$20/hr was used except for on-site storage and handling work where an average rate of \$30/hr was used.
7. The following unit costs were used:

Electricity	=	\$0.067/kw-hour
Process Water	=	\$1.37/1,000 gallons
Fuel	=	\$0.98/gallon
Material Costs	=	Material specific
TSDf Fees (Contract Values)	=	Waste specific
Wastewater Treatment	=	\$1.05/1,000 gallons
10. The costs required for military specifications or technical order changes were not included. If there is possibility of a change required, it was noted in the option description.

3.4 PRIORITIZATION OF P2 OPTIONS FOR IMPLEMENTATION

Following technical and economic feasibility evaluation, the identified P2 options were prioritized based on criteria such as cost factors hazardous material usage, target chemicals released, waste generation, etc. Worksheet 14 - Options Summary for Final Ranking, was used for this evaluation.

As shown on Worksheet 14, eight criteria were used to evaluate and prioritize the options:

1. Hierarchy of option types;
2. Projected ease of implementation;
3. Payback period and net present value of benefits and investment;
4. Reduction in ODS release;
5. Reduction in toxic chemical release;
6. Reduction in air emissions;
7. Reduction in wastewater generation; and
8. Reduction in hazardous waste generation.

Each option was assigned points (0, 1, or 2) for each criterion as shown in Table 3.3. Based on this point system, the total points an option could receive varied from 16 (highest rank) to zero (lowest rank). Ranking factors and assigned points are summarized on Worksheets 14 and are presented for each option in Appendix M. Options were then grouped by total points from highest to lowest. Intangible factors, which were subjective and therefore to difficult cost were not used in prioritization process.

3.5 DATA QUALITY

The opportunity assessment contains a certain amount of inherent error due to the collection and manipulation of numerous data from written sources and personnel interviews. In all cases, Parsons ES selected the most reliable data sources that could be obtained within the allowed schedule, including data collected during the site visits, follow-on interviews with site representatives, database information, and discussions with suppliers and manufacturers of products.

TABLE 3.3
OPTION RANKING METHODOLOGY
NS MAYPORT, FL

Ranking Category	Description	Points/Ranges ^(a)		
		0	1	2
Option Type	The type of option based on the Navy hierarchy.	Treatment/ Disposal	Recycling	Source Reduction
Ease of Implementation	The perceived degree of effort to implement the option.	Requires Further Testing/Study	Off-the-Shelf Equipment/Materials	Personnel/ Procedural
Payback Period	The number of years required to recoup initial investment. The payback period was evaluated in relation to the option's net present value. If the net present value is positive, then the following payback period ranges apply. If the net present value is negative, then the option automatically receives 0 points.	>5	3-5	0-3
ODS Reduction	The anticipated reduction of ODS (lb/yr) achieved by the option.	0-10	11-340	>340
Released Target Chemical Reduction	The anticipated reduction of target chemicals (lb/yr) characterized as releases.	0-25	26-425	>425
Air Emissions Reduction	The anticipated reduction in total air emissions (lb/yr).	0-25	26-475	>475
Wastewater Reduction	The anticipated reduction in wastewater generated (gal/yr).	0-6,000	6,001-25,000	>25,000
Hazardous Waste Reduction	The anticipated reduction in hazardous waste generated (lb/yr).	0-10	11-600	>600

^(a) Ranges were developed based on the actual data.

Attempts were made during data collection site visits and follow-up telephone calls to record P2 options that were planned or already implemented by each organization. Nevertheless, some options evaluated during this study may have already been tested by an organization.

The presentation of the hazardous material and waste stream totals have been rounded to two significant figures. Because of the probable inaccuracies associated with some of the collected data and the numerous assumptions made to complete the economic analyses, the cost figures presented in this report have an assumed accuracy range of ± 50 percent.

APPENDIX D

ORGANIZATIONAL DESCRIPTIONS

1.1 NAVAIR ORGANIZATION

The data collection teams visited process sites belonging to two NAVAIR organizations. The two organizations are the Aircraft Intermediate Maintenance Department (AIMD) and the HSL Squadrons. The AIMD organization performs intermediate level maintenance on aircraft, such as painting, engine inspection, minor engine repair, and other maintenance support on a smaller scale than the depot level. Twenty-nine process sites were evaluated in the AIMD organization. Several Helicopter Anti-Submarine Light (HSL) Squadrons comprise the Squadrons organization. These squadrons mainly provide light service to aircraft such as corrosion control, fluid changeouts and various other flight line servicing. Six process sites were evaluated in the Squadrons organization. The NAVAIR organizations and their respective process sites are presented in Table D.1

1.2 NAVFAC ORGANIZATION

Process sites for eight NAVFAC organizations were visited at Mayport. The NAVFAC organizations are Fleet Training Center, Harbor Operations Division, Medical, Public Works Center (PWC), CBU-420, Security Department, Weapons Department, and the Morale, Welfare and Recreation Department (MWR). The Fleet Training Center, in which three process sites were evaluated, offers many instructional and operational training courses such as firefighting and damage control. Sixteen process sites were evaluated in the Harbor Operation Division. These process sites perform light maintenance and other services associated with tugboats and other small boats. The Medical organization includes the hospital and dental offices. Three process sites in this organization were visited. The MWR organization has 15 process sites that were evaluated. These recreational sites include such processes as golf course maintenance, personal vehicle maintenance, and the swimming pool. The PWC organization provides a wide variety of management and/or maintenance to different military units. The PWC

TABLE D.1
NAVAIR PROCESS DISTRIBUTION
NS MAYPORT, FL

ORGANIZATION/ PROCESS IDENTIFICATION	PROCESS DESCRIPTION	BUILDING NUMBER
AIMD		
AICN019901	REPAIR PARALOFT EQUIP	1553
AIID010001	PAINT STRIPPING PAINTING	1553
AIID010002	PAINT STRIPPING	1553
AIID010501	BEAD BLAST PAINT REMOVAL	1600
AIID020701	PARTS DEGREASING	1553
AIID050001	PAINTING	1553
AIID050002	PAINTING	1553
AIID050003	GSE PAINTING	1600
AIID050004	CORROSION CONTROL	1553
AIID070001	FABRICAT ION OF PARTS	1553
AIID100001	MACHINE SHOP	1553
AIID140301	FLUORESCENT PENETRANT	1553
AIID140401	ULTRA SONIC TESTING	1553
AIID140601	XRAY INSPECTION	1553
AIID220001	ELECTRONIC REPAIR	1553
AIID230101	HYDRAULIC	1553
AIID230401	ENGINE REPAIR	1553
AIID230402	ROTOR ASSEMBLY REPAIR	1553
AIID230403	MODULAR COMPONENT REPAIR	1553
AIID230901	ENGINE TESTING	1609
AIID239901	INSPECT REPAIR	1553
AIID239902	PREVENTIVE MAINTENANCE	1553
AIID239903	GSE SERVICING OVERHAUL	1600
AIID999901	LEAD ACID BATTERY	1553
AIID999902	NICKEL CADMIUM	1553
AOID020701	PARTS DEGREASING	91
AOID050001	PAINTING	91
AOID220001	RADAR MAINTENANCE	91
AOID230001	ARRESTING GEAR MAINTENANCE	424
HSL		
HOID050001	CORROSION CONTROL	1552
HOID050002	SERVICE CRAFT MAINTENANCE	1886
HOID230001	AIRFRAMES REPAIR	1552
HOID230002	POWER PLANT ENGINE REPAIR	1552
HOID230003	PHASE INSPECTION REPAIR	1552
HOML020001	FLIGHT LINE SERVICING	1607

conducts vehicle maintenance, hazardous waste pickups, building and equipment maintenance, and other utility/construction activities at 16 evaluated process sites. Seven process sites were visited in the CBU-420 organization. This organization performs vehicle maintenance, self-help services, weapons management, and other various maintenance activities. Both the Security Department and the Weapons Department conduct weapons cleaning, handling, and storage operations. Each of these organizations has two process sites that were evaluated. The NAVFAC organizations and their respective process sites are presented in Table D.2

1.3 NAVSEA ORGANIZATION

The data collection teams visited process sites from the following three NAVSEA organizations: the Supervisor of Ship Building, Conversion and Repair (SUPSHIP) Atlantic Marine, SUPSHIP North Florida Shipyard, and the Shore Intermediate Maintenance Activity (SIMA) organization. Eight process sites were evaluated in the Atlantic Marine SUPSHIP and three process sites were evaluated in the North Florida Shipyard SUPSHIP. The SUPSHIP organizations provide depot-level maintenance, such as major engine inspections and repair, on Navy ships. The SUPSHIP organizations also plan and execute ship availabilities and oversee private contracts associated with shipbuilding and ship maintenance. The SIMA organization provides intermediate level maintenance to ships of the Atlantic Fleet. The SIMA maintenance includes fluid changeouts, light engine/equipment repairs, painting, and other various activities. There are fifty-nine process sites that were visited in the SIMA organization. The NAVSEA organizations and their respective process sites are presented in Table D.3.

TABLE D.2

**NAVFAC PROCESS DISTRIBUTION
NS MAYPORT, FL**

ORGANIZATION/ PROCESS IDENTIFICATION	PROCESS DESCRIPTION	BUILDING NUMBER
CBU 420		
CBCN010001	GENL BASE MAINTENANCE	1613
CBID020701	DEGREASER DIPPING	1613
CBID050501	VEHICLE PAINTING	1613
CBID111301	WELDING	1613
CBML010501	WEAPONS SYSTEM	1613
CBSR020001	VEHICLE MAINTENANCE	1613
CBSR110001	SELF HELP	290
FLEET TRAINING CENTER		
FTID050001	PAINTING	351
FTSR069901	FIRE FIGHTING TRAINING	351
HARBOR OPERATIONS		
HSID010401	SAND BLASTING	209
HSID020701	DEGREASING-ENGINES	1886
HSID050501	PRINTING	1886
HSID050701	PAINTING ENGINE MAINTENANCE	1886
HSID100001	METAL FABRICATION	209
HSID160001	FIBERGLASS	1886
HSID239901	DAMAGE CONTROL	1886
HSSR019901	BATTERY REPLACEMENT	1886
HSSR999901	MACHINARY MAINTENANCE	1613
HSSR999902	ENGINE MAINTENANCE	1886
HTID050501	PRESERVATION	1589
HTID050502	PRESERVATION - PIERS	1589
HTID220001	ELECTRICAL	1589
HTID230001	ENGINE MAINTENANCE	1589
HTID230002	YD MAINTENANCE	197
HTSR069901	FIRE FIGHTING	1589
MEDICAL		
MEID140601	RADIOGRAPHY X-RAY	1363
MEMD010001	MISC MEDICAL OPERATIONS	1363
DEMD020001	DENTAL OPERATIONS	1363
MWR		
MAID021001	DEGREASING	414
MAID050001	PAINT BOOTH	414
MASR020001	HOBBY SHOP	414
MGSR030001	GOLF COURSE MAINTENANCE	187
MMID050501	PAINTING BRUSH ROLLER	414
MMSR040001	MAINT BLDG GROUNDS	414
MOSR099901	OUTDOOR REC EQUIP MAINTENANCE	392
MSSR099901	SWIMMING POOL MAINTENANCE	

TABLE D.2
NAVFAC PROCESS DISTRIBUTION
NS MAYPORT, FL

ORGANIZATION/ PROCESS IDENTIFICATION	PROCESS DESCRIPTION	BUILDING NUMBER
MVID021001	DEGREASING EMULSION	349
MVSR020002	VEHICLE MAINTENANCE	349
MVSR040001	FACILITY MAINTENANCE	1391
PMSR030001	GOLF COURSE MAINTENANCE	181
PMSR040001	MAINTING BUILDING GROUNDS	414
PMSR099501	OUTDOOR REC	392
PMSR099901	OUTDOOR REC	391
PWC		
DWSR169901	WATER TREATMENT	1906
IRIR010001	INSTALLATION RESTORATION	
NEID020701	DEGREASING-DIPPING	265
NESR020001	VEHICLE MAINTENANCE	265
OWSR159901	HW/SEWER TREATMENT	1346
OWSR159902	OIL WATER SEPARATORS	VAR
PMCN019901	MISC CARPENTRY	38
PMID050001	PAINTING	38
PMID230801	ELECTRICAL REPAIR/MAINT	12
PMSR040201	HVAC MAINT	12
PMSR049901	PREVENTATIVE MAINTENANCE	12
PMSR100001	BOILERS	MISC
PVID021001	MOTOR POOL PARTS WASHER	25
PVSR020001	MOTOR POOL	25
ROCN099901	CONSTRUCTION ACTIVITIES	
WWSR159901	HW/SEWER TREATMENT	285
SECURITY		
SEID050001	PAINTING SIGNS	1591
SEML010501	WEAPONS CLEANING	1591
WEAPONS		
EOML010001	BOMB SQUAD	190
WPML010501	WEAPONS CLEANING	190
WPML019901	ORDNANCE STORAGE/HANDLING	190

**TABLE D.3
(CONTINUED)**

**NAVSEA PROCESS DISTRIBUTION
NS MAYPORT, FL**

ORGANIZATION/ PROCESS IDENTIFICATION	PROCESS DESCRIPTION	BUILDING NUMBER
ATLANTIC MARINE (SUPSHIP)		
AMID010203	ABRASIVE BLAST	SHIPS
AMID010302	ABRASIVE BLAST	SHIPS
AMID020605	PART DEGREASING CLEANING	SHIPS
AMID050501	EPOXY PAINTING	SHIPS
AMID050506	ENAMEL PAINTING	SHIPS
AMID050507	PAINTING CLEANUP	SHIPS
AMID140304	DYE PENETRANT TESTING	SHIPS
AMID239908	PENETRATING COMPOUND	SHIPS
NORTH FLORIDA SHIPYARD (SUPSHIP)		
NFID020701	PART DEGREASING	SHIPS
NFID050502	EPOXY PAINTING	SHIPS
NFID140303	DYE PENETRANT TESTING	SHIPS
SIMA		
SIID010201	ANTENNA REPAIR	1488
SIID010213	SANDBLASTING	1448
SIID010231	PAINT BLASTING GLASS BEAD	1488
SIID010233	PAINT BLASTING GLASS BEAD	1488
SIID010301	ABRASIVE GRIT BLASTING	1488
SIID010302	ABRASIVE GRIT BLASTING	1488
SIID010303	BLASTING METAL PARTS	1488
SIID010401	SAND BLASTING MOTORS	1488
SIID020401	PARTS CLEANING AQUEOUS	1488
SIID020616	ACETONE DEGREASING CLEAN	1448
SIID020627	PRECLEANING PARTS	1488
SIID020636	CLEAN DEGREASE PARTS	1488
SIID020701	WEAPONS HANDLING EQUIPMENT	1488
SIID020714	PART DEGREASE AND CLEAN	1448
SIID020724	FABRICATE WIRE ROPE	1488
SIID020725	METAL PARTS DEGREASING	1488
SIID020726	DEGREASING METAL PARTS	1488
SIID029937	ADHESIVE REMOVAL	1488
SIID029938	CARBON REMOVAL	1488
SIID040129	PLATING METAL PARTS	1488
SIID050101	PAINTING FIBERGLASS ANTENNAS	1488
SIID050102	PAINTING VARIOUS PARTS	1488
SIID050701	SPRAY PAINT AEROSOL CAN	1488
SIID050702	MISSILE LAUNCHER PAINTING	1488
SIID050715	PAINT BOOTH	1448
SIID060101	VARNISH TANK	1488
SIID060402	FLAME SPRAY	1488

**TABLE D.3
(CONTINUED)**

**NAVSEA PROCESS DISTRIBUTION
NS MAYPORT, FL**

ORGANIZATION/ PROCESS IDENTIFICATION	PROCESS DESCRIPTION	BUILDING NUMBER
SIID089901	THERMAL INSULATION REMOVAL	1488
SIID100028	MACHINE COOLANT	1488
SIID100117	BAND SAW CUTTING	1448
SIID140301	NON DESTRUCTIVE TESTING	1488
SIID140601	RADIOGRAPHIC INSPECTION	1488
SIID170201	ASBESTOS REMOVAL	1482
SIID170632	ASBFSTOS GASKET WORK	1488
SIID170634	ASBESTOS GASKET WORK	1488
SIID190001	INSULATION AND PCMS	1488
SIID201220	STAINING	1488
SIID201319	PAINTING	1488
SIID209921	FILLING WOOD	1488
SIID220101	REPAIR TEST EQUIPMENT	1448
SIID220111	MECH INSTRUMENT REPAIR	1488
SIID229901	BATTERY REPLACEMENT	1488
SIID230001	DIVE SHOP EQUIPMENT MAINTENANCE	1488
SIID230401	BEARING GREASE	1488
SIID230402	MOTOR WINDING ASSEMBLY	1488
SIID230412	INSTR. GAUGE CLEANING	1488
SIID230801	ELEC MOTOR CONTROLLER REPAIR	1488
SIID239901	EQUIPMENT MAINTENANCE	1488
SIID239903	FLUID CHANGEOUT LUBRICATE	1488
SIID239904	MAINTENANCE OF CRANES	1488
SIID239905	DESCALING OF HEAT EXCHANGER	1488
SIID239906	HP WATER MAINTENANCE MACHINES	1488
SIID240001	OIL ANALYSIS	1488
SIML010002	WEAPON SYSTEM MAINTENANCE	1488
SIML010003	GUN MISSILE STRUCTURE REPAIR	1488
SIML019901	KEVLAR PENDANTS LIFELINE MANU.	1488
SIMS010201	SAIL LOFT UPHOLSTREY SEAT	1488
SISR010001	REPAIR RAPID INFLATABLE	1488
SISR129930	PHOTO ENGRAVING	1488

APPENDIX E

EXAMPLE COPY OF WORKSHEETS

Appendix E includes a copy of worksheets used for opportunity assessment at Naval Station Mayport. Worksheets 1-5 were completed in the field during data collection task. Worksheet 6 (Material Accounting Report) and Worksheet 7 (Final Process Flow Diagram) were used for data reduction and develop representative process flow diagrams. Worksheets 9-11 were completed during the technical feasibility evaluation of options. Worksheets 12-13 were completed for economic analysis of options. Worksheet 14, Options Summary for Final Rankings, was completed for prioritization of options.

APPENDIX F

PROCESS INFORMATION, MATERIAL, AND WASTE TABLES

This appendix contains the process information, process material, and process waste reports, presented as Tables F.1, F.2, and F.3 respectively. A brief description of data fields and the page numbers where they are located are provided.

TABLE F.1
PROCESS INFORMATION REPORT

Data Fields	Descriptions	Page Numbers
ID Number	Assigned process identification number (See Table 1.2, Appendix C).	1-7
Building	Building or facility number where process is located.	1-7
Contractor/ Organization	Two-letter identifier of organization/contract or who operates process.	1-7
Contact	Point of contact for process information.	1-7
Title	Title of the point of contact.	1-7
Phone	Phone number or four-digit extension of POC.	1-7
Interview Date	Date information was collected in the field.	1-7
Int 1 and Int 2	Initials team member who collected information.	1-7
I. D. #8-14		
Process Description	Brief description of process.	8-14
Process Code	Two-letter process code (see Table 1.2, Appendix C)	8-14
Weapon's System	Name of weapon's system being processed.	8-14
Part Type	Name of the part processed	8-14
Substrate	Material of construction of part	8-14
I. D. 15-21		
Production Unit	Description of most logical production unit for the process.	15-21
Production Quantity	Number of production unit produced per year.	15-21

TABLE F.1
PROCESS INFORMATION REPORT
(Continued)

Data Fields	Descriptions	Page Numbers
Tank Degreaser	Checked if tank degreaser is used in process.	15-21
Plating	Checked if plating tanks are used in process.	15-21
Paint Booth	Checked if paint booth is used in process.	15-21
Blasting	Checked if abrasive blasting is used in process.	15-21
Photo	Checked if photographic developing is used in process.	15-21
Grinding	Checked if machining and grinding is used in process.	15-21
NDI	Checked if non-destructive inspection is used in process.	15-21
I. D. 22-28		
Steam	Quantity of steam required per year for process (BTU).	22-28
Process Water	Quantity of process water required per year for process (gallon).	22-28
Cooling Water	Quantity of cooling water required per year for process (gallon).	22-28
Fuel	Quantity of fuel required per year for process.	22-28
Fuel (gal/yr)	Checked if fuel is recorded in gallons per year.	22-28
Fuel (ft3/yr)	Checked if fuel is recorded in cubic feet per year.	22-28
Fuel Type	Type of fuel used by process.	22-28
Electricity	Quantity of electricity required per year for process (KWH).	22-28
Persons	Number of persons who may perform process operations	22-28
Hours/Person	Number of hours per year each person performs process operation	22-28
PPE Type	Personal protective equipment required by the process	22-28
Vapor Degreaser	Checked if vapor degreaser is used in process.	22-28
Training	Number of hours per year each person is trained for process.	22-28
Permitting	Permit name, number and number of hours per year required for environmental permits.	22-28

TABLE F.2
MATERIAL REPORT

Data Fields	Descriptions	Page Numbers
ID Number	Assigned process identification number.	1-31
Material Name	Name of material used in process.	1-31
NSN	National stock number or assigned "dummy" stock number for material.	1-31
Manufacturer/Cage	Cage number of NSN items and manufacturer name for "dummy" stock number items.	1-31
Source Code	The two-digit source code indicating the data source and the perceived accuracy. 1 - Interview Data 2 - Database\Log Data 3 - Calculated Data based on Assumptions A - Good B - Suspect C - Very Poor	1-31
State	Physical state of the material: S = solid, L = liquid, G = gas.	1-31
Shelf Life	N = Shelf-life of material has not expired; Y = Shelf-life of material has expired.	1-31
Quantity	The number of containers of materials used in the process.	1-31
Size	The size of the container material is issued in.	1-31
Unit	The measuring unit of the contained materials: G = gallon, L = pound, Q = quart, P = pint, I = liter, O = ounce.	1-31
Type	The type of container the material is issued in.	1-31
Rate	The usage rate of material quantity: D = day, W = week, M = month, Y = year, Q = quarter	1-31
Mil-Spec	Military specifications if any requiring use of the material.	1-31
I. D. 32-62		
MRC	The MRC requiring use of material.	32-62
Tech Pub	Technical Publication requiring use of this material.	32-62
Data Fields Added during database development		
Change	Change in quantity estimated from material accounting.	32-62
Quantity Total (lbs/yr)	Final quantity of material estimated from material accounting.	32-62
Specific Gravity CF	Specific gravity of material used for calculation of quantity conversion factor used for calculation of quantity.	32-62

TABLE F.3
WASTE REPORT

Data Fields	Descriptions	Page Number
ID Number	Assigned process identification number.	1-21
Waste Name	Name of waste generated by the process.	1-21
Waste Stream	Two-digit waste stream number (see Appendix C).	1-21
Source Code	The two-digit source code indicating the data source and the perceived accuracy. 1 - Interview Data 2 - Database\Log Data 3 - Calculated Data based on Assumptions A - Good B - Suspect C - Very Poor	1-21
Triggered	The event that triggers the waste discharge.	1-21
Disposal Method	The one-letter code designating the disposal method: D = disposal, T = treatment, R = recycle.	1-21
Destination	The one-letter code designating on-site or off-site disposal: N = on-site, F = off-site	1-21
Disposition	The one-letter code designating the waste's disposition: H = Hazardous Waste, W = Wastewater, A = Air Emissions R = Recycled Waste, S = Non hazardous Waste.	1-21
Quantity	The number of containers, pounds, or gallons of waste generated by the process.	1-21
Size	The size of the waste container (if applicable).	1-21
Unit	The measuring unit of the contained waste: G = gallon, L = pound, Q = quart, P = pint, I = liter, O = ounce.	1-21
Type	The waste container type.	1-21
Rate	The generation rate of waste quantity: D = day, W = week, M = month, Y = year, Q = quarter.	22-42
Waste Analyses	The number of analyses performed on the waste stream each year.	22-42
Quantity (lb/yr)	The quantity of waste generated in pounds (if available).	22-42
Data fields added during database development		22-42
Change	Change in quantity estimated from material accounting.	22-42
Quantity Total (lbs/yr)	Final quantity of material estimated from material accounting.	22-42
Density	Density of material used for calculation of quantity.	22-42

CF	Conversion factor used for calculation of quantity.	22-42
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APPENDIX G

TARGET COMPOUND REPORT AND PROCESS MATERIAL GROUPING REPORT

Target Compound Report provides a list of process materials consisting of any of the 350 compounds targeted by Navy for reduction. National stock number, manufacturer's cage numbers are provided for proper identification of materials. All target compounds and its percentage are included.

Process material grouping report provides a list of process identification numbers, process material names, national stock number, manufacturer's cage, grouping of the material designated by a letter and specific gravity of the material. An explanation of grouping designation letter is provided below.

Grouping Category	Grouping Letter
Paints\Coatings\Thinners\Strippers	P
Petroleum Products\Antifreeze	O
Degreasers\Solvents\Alcohols	S
Pesticides\Herbicides	I
Detergents\Cleaners	D
Adhesives\Sealants	V
Acids\Bases	B
NDI\Photographic Chemicals	N
Miscellaneous Chemicals	M

APPENDIX H

HAZARDOUS MATERIAL USAGE SUMMARY

Appendix H provides a summary of hazardous material usage by grouping categories for NAVAIR, NAVFAC, and NAVSEA presented in Tables H.1, H.2, and H.3 respectively.

TABLE H.1

**NAVAIR SUMMARY OF HAZARDOUS MATERIAL USAGE (LB/YR)
NS MAYPORT, FL**

	PAINTS/ COATINGS/ THINNERS/ STRIPPERS	PETROLEUM PRODUCTS/ ANTIFREEZE	DEGREASERS/ SOLVENTS/ ALCOHOLS	PESTICIDES/ HERBICIDES	DETERGENTS/ CLEANERS	ADHESIVES/ SEALANTS	ACIDS/ BASES	NDI/ PHOTOGRAPHIC	MISCELLANEOUS	TOTAL
AIID010001	159		37							196
AIID010002	194								526	720
AIID010501	13								2,500	2,513
AIID020701			782							782
AIID050001	937		146							1,083
AIID050002	390									390
AIID050003	6,432		13						13	6,458
AIID050004	701									701
AIID070001	124	11				263				398
AIID100001		3	44							47
AIID140301	70		22							92
AIID140401			22							22
AIID140601								104		104
AIID220001	4		6			7			15	32
AIID230101		778	13							791
AIID230401		533							2	535
AIID230402	112		17			1,236			7	1,372
AIID230403		1,679				202			3	1,884
AIID230901		81,763								81,763
AIID239902		12,684	891		41					13,616
AIID239903		4,972	689							5,661
AIID999901							1,028			1,028
AOID020701			66							66
AOID050001	624									624
AOID220001	1	41	78							120
AOID230001		917	17			28	20			982
HOID050001	1,141		13						121	1,275
HOID050002	11,115									11,115
HOID230001	17	1,447	41						661	2,166
HOID230002		1,921								1,921

TABLE H.1

**NAVAIR SUMMARY OF HAZARDOUS MATERIAL USAGE (LB/YR)
NS MAYPORT, FL**

	PAINTS/									
	COATINGS/	PETROLEUM	DEGREASERS/							
PROCESS	THINNERS/	PRODUCTS/	SOLVENTS/	PESTICIDES/	DETERGENTS/	ADHESIVES/	ACIDS/	NDI/		
IDENTIFIER	STRIPPERS	ANTIFREEZE	ALCOHOLS	HERBICIDES	CLEANERS	SEALANTS	BASES	PHOTOGRAPHIC	MISCELLANEOUS	TOTAL
HOID230003		263	81							344
HOML020001		3,313	680							3,993
TOTAL	22,034	110,325	3,658	0	41	1,736	1,048	104	3,848	142,794

TABLE H.2

**NAVFAC SUMMARY OF HAZARDOUS MATERIAL USAGE (LB/YR)
NS MAYPORT, FL**

	PAINTS/									
	COATINGS/	PETROLEUM	DEGREASERS/							
PROCESS	THINNERS/	PRODUCTS/	SOLVENTS/	PESTICIDES/	DETERGENTS/	ADHESIVES/	ACIDS/	NDI/		
IDENTIFIER	STRIPPERS	ANTIFREEZE	ALCOHOLS	HERBICIDES	CLEANERS	SEALANTS	BASES	PHOTOGRAPHIC	MISCELLANEOUS	TOTAL
CBCN010001	1,217					253			218	1,688
CBID020701			456							456
CBID050501	580									580
CBID111301									21	21
CBML010501		7	7				40			54
CBSR020001	15	3,842	499			34	173		68	4,631
CBSR110001	96								375	471
DEMD020001								479	8,411	8,890
EOML010001	1,016	2				17				1,035
HSID010401									20	20
HSID020701			129							129
HSID050501	3,682		23							3,705
HSID050701	186									186
HSID100001		42								42
HSID160001	38					220				258
HSID239901	37	22	103			1				163
HSSR019901		2					482			484
HSSR999901		271								271
HSSR999902		38,095								38,095
HTID050501	1,734		226							1,960
HTID050502	4,714									4,714
HTID220001	48						851		17	916
HTID230001	28	1,537	1							1,566
HTID230002	1,726	1,838	731				518			4,813
HTSR069901	104	196							371	671
MAID021001			2,346							2,346
MASR020001			2,912							2,912
MEID140601								1,291		1,291
MEMD010001			42							42
MMID050501	231									231

TABLE H.2

**NAVFAC SUMMARY OF HAZARDOUS MATERIAL USAGE (LB/YR)
NS MAYPORT, FL**

	PAINTS/									
	COATINGS/	PETROLEUM	DEGREASERS/							
PROCESS	THINNERS/	PRODUCTS/	SOLVENTS/	PESTICIDES/	DETERGENTS/	ADHESIVES/	ACIDS/	NDI/		
IDENTIFIER	STRIPPERS	ANTIFREEZE	ALCOHOLS	HERBICIDES	CLEANERS	SEALANTS	BASES	PHOTOGRAPHIC	MISCELLANEOUS	TOTAL
MMSR040001	330		469	99	202	39	13		21	1,173
MSSR099901			598						12,700	13,298
MVID021001			391							391
MVSR020002		209,402					1,000			210,402
MVSR040001	87	5	782		3,377					4,251
NEID020701			912							912
NESR020001		11,493	228				1,000			12,721
PMID230801		110	593							703
PMSR040201		44	1,762							1,806
PMSR049901	93	60	266							419
PMSR099901	767	69,793								70,560
PVID021001			9,382							9,382
PVSR020001	59	2,093,078	760				1,529			2,095,426
SEID050001	477									477
SEML010501		16	9							25
WPML010501	7	479	596							1,082
WPML019901	379									379
TOTAL	17,651	2,430,334	24,223	99	3,579	564	5,606	1,770	22,222	2,506,048

TABLE H.3

**NAVSEA SUMMARY OF HAZARDOUS MATERIAL USAGE (LB/YR)
NS MAYPORT, FL**

	PAINTS/ COATINGS/ THINNERS/ STRIPPERS	PETROLEUM PRODUCTS/ ANTIFREEZE	DEGREASERS/ SOLVENTS/ ALCOHOLS	PESTICIDES/ HERBICIDES	DETERGENTS/ CLEANERS	ADHESIVES/ SEALANTS	ACIDS/ BASES	NDI/ PHOTOGRAPHIC	MISCELLANEOUS	TOTAL
AMID010203									500	500
AMID010302									300	300
AMID020605	1,281									1,281
AMID140304	19		8					305		332
AMID239908			669							669
NFID020701			1,173							1,173
NFID140303			12					113	66	191
SIID010201									1,200	1,200
SIID010213									38	38
SIID010231									38	38
SIID010233									148	148
SIID010301									75	75
SIID010302	30								125	155
SIID010303	54								300	354
SIID010401	20								60	80
SIID020401					10					10
SIID020616			41							41
SIID020627			76							76
SIID020636			122						11	133
SIID020701			2,346							2,346
SIID020714			782							782
SIID020724			108							108
SIID020725			16,093							16,093
SIID020726			446							446
SIID029937									10	10
SIID029938									10	10
SIID040129			926							926
SIID050101	257		65						3	325
SIID050102	8,931		1,916							10,847
SIID050701	345									345

TABLE H.3

**NAVSEA SUMMARY OF HAZARDOUS MATERIAL USAGE (LB/YR)
NS MAYPORT, FL**

	PAINTS/									
	COATINGS/	PETROLEUM	DEGREASERS/							
PROCESS	THINNERS/	PRODUCTS/	SOLVENTS/	PESTICIDES/	DETERGENTS/	ADHESIVES/	ACIDS/	NDI/		
IDENTIFIER	STRIPPERS	ANTIFREEZE	ALCOHOLS	HERBICIDES	CLEANERS	SEALANTS	BASES	PHOTOGRAPHIC	MISCELLANEOUS	TOTAL
SIID050702	67									67
SIID050715	285									285
SIID060101	5,603		435							6,038
SIID060402									24	24
SIID100028		485								485
SIID100117		382								382
SIID140301			228							228
SIID140601			9					194		203
SIID170632									936	936
SIID170634									54	54
SIID190001	239		27			434				700
SIID201220	174									174
SIID201319	579									579
SIID209921	9		10			5				24
SIID220101			18						1	19
SIID220111			33							33
SIID229901							72			72
SIID230001	11	911	73							995
SIID230401		52								52
SIID230412			65							65
SIID230801		2	5							7
SIID239903		98								98
SIID239904	5	712								717
SIID239905									100	100
SIID239906	7	3,322	20				120			3,469
SIID240001		2,220	6,994						2	9,216
SIML010002		1,120								1,120
SIML010003			1,634							1,634
SIML019901	21		13							34
SIMS010201						141				141

TABLE H.3

**NAVSEA SUMMARY OF HAZARDOUS MATERIAL USAGE (LB/YR)
NS MAYPORT, FL**

	PAINTS/									
	COATINGS/	PETROLEUM	DEGREASERS/							
PROCESS	THINNERS/	PRODUCTS/	SOLVENTS/	PESTICIDES/	DETERGENTS/	ADHESIVES/	ACIDS/	NDI/		
IDENTIFIER	STRIPPERS	ANTIFREEZE	ALCOHOLS	HERBICIDES	CLEANERS	SEALANTS	BASES	PHOTOGRAPHIC	MISCELLANEOUS	TOTAL
SISR010001		284				6				290
SISR129930						52		746		798
TOTAL	17,937	9,588	34,347	0	10	638	192	1,358	4,001	68,071

APPENDIX I

FINAL MATERIAL ACCOUNTING REPORTS

Appendix I provides Final Material Accounting Reports for process sites. Materials used by the process, national stock number, manufacturer's cage number, material source code, material quantity, change quantity estimated from material accounting and final quantity of the material are presented on the left side. Wastes generated by the process, waste stream codes (see Appendix C, Table 1.3) waste source codes, disposition (air emissions, solid waste, hazardous waste, recycle, consumed in process, or wastewater), waste quantity, change quantity estimated from material accounting and final quantity of the waste are presented on the right side of the report.

APPENDIX J

ENVIRONMENTAL FATE CALCUATIONS SUMMARY

Appendix J provides a break-up of process wastes quantities by its environmental fate as a hazardous waste, wastewater, air emissions, non-hazardous waste and recycled waste. For hazardous wastes, a further break-up by waste streams is provided. Process sites for NAVAIR, NAVFAC, and NAVSEA are summarized in Tables J.1, J.2, and J.3 respectively.

TABLE J.1

**NAVAIR SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	AIID010001	AIID010002	AIID010501	AIID020701	AIID050001	AIID050002	AIID050003	AIID050004	AIID070001
WS	HAZARDOUS WASTE									
01	ABRASIVE BLAST RESIDUE		694	3,095						
02	WASTE BATTERY									
03	WASTE BATTERY ACID									
04	WASTE CHEMICAL PAINT STRIPPER	83	13							
09	DRAINED FUEL									
10	WASTE ANTIFREEZE									
11	CONTAMINATED OIL									
13	WASTE MACHINE COOLANT									74
14	METAL SHAVINGS/RESIDUE									
15	WASTE NDI FLUID									
16	WASTE PAINT REMNANT									
17	WASTE PAINT/CLEANUP SOLVENT					51	20	600	154	
20	WASTE FIXER/DEVELOPER									
21	WASTE CLEANING SOLVENT									
24	USED RAGS	101				85	181	3,000	35	130
25	USED FILTERS					30	35	500	75	
	TOTAL	184	707	3,095	0	166	236	4,100	264	204
WS	WASTEWATER									
33	WASTEWATER-AIRCRAFT/VEHICLE CLEANING									
38	WASTEWATER-OTHER RINSING OPERATIONS									
	TOTAL	0	0	0	0	0	0	0	0	0
WS	AIR EMISSION									
43	FUGITIVE-VOC EMISSION	67	6		14	880	197	3,396	384	69
44	FUGITIVE-OTHER EMISSION		7	30						

TABLE J.1

**NAVAIR SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	AIID010001	AIID010002	AIID010501	AIID020701	AIID050001	AIID050002	AIID050003	AIID050004	AIID070001
	TOTAL	67	13	30	14	880	197	3,396	384	69
WS	NON-HAZARDOUS WASTE									
24	USED RAGS									112
	TOTAL	0	0	0	0	0	0	0	0	112
WS	RECYCLED WASTE									
03	WASTE BATTERY ACID									
08	WASTE OIL/PNEUDRAULIC FLUID									
09	DRAINED FUEL									
21	WASTE CLEANING SOLVENT									
22	WASTE PETROLEUM-BASED SOLVENT				768					
24	USED RAGS									
	TOTAL	0	0	0	768	0	0	0	0	0

TABLE J.1

**NAVAIR SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	AIID100001	AIID140301	AIID140401	AIID140601	AIID220001	AIID230101	AIID230401	AIID230402	AIID230403
WS	HAZARDOUS WASTE									
01	ABRASIVE BLAST RESIDUE									
02	WASTE BATTERY									
03	WASTE BATTERY ACID									
04	WASTE CHEMICAL PAINT STRIPPER									
09	DRAINED FUEL									
10	WASTE ANTIFREEZE									
11	CONTAMINATED OIL						402			
13	WASTE MACHINE COOLANT									
14	METAL SHAVINGS/RESIDUE	220								
15	WASTE NDI FLUID		116		74					
16	WASTE PAINT REMNANT									
17	WASTE PAINT/CLEANUP SOLVENT									
20	WASTE FIXER/DEVELOPER				64					
21	WASTE CLEANING SOLVENT									
24	USED RAGS			10					347	
25	USED FILTERS									
	TOTAL	220	116	10	138	0	402	0	347	0
WS	WASTEWATER									
33	WASTEWATER-AIRCRAFT/VEHICLE CLEANING									
38	WASTEWATER-OTHER RINSING OPERATIONS									
	TOTAL	0	0	0	0	0	0	0	0	0
WS	AIR EMISSION									
43	FUGITIVE-VOC EMISSION	9	72	21	5	25			155	6
44	FUGITIVE-OTHER EMISSION									

TABLE J.1

**NAVAIR SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	AIID100001	AIID140301	AIID140401	AIID140601	AIID220001	AIID230101	AIID230401	AIID230402	AIID230403
	TOTAL	9	72	21	5	25	0	0	155	6
WS	NON-HAZARDOUS WASTE									
24	USED RAGS						156		20	2,875
	TOTAL	0	0	0	0	0	156	0	20	2,875
WS	RECYCLED WASTE									
03	WASTE BATTERY ACID									
08	WASTE OIL/PNEUDRAULIC FLUID						350	426		646
09	DRAINED FUEL									
21	WASTE CLEANING SOLVENT									
22	WASTE PETROLEUM-BASED SOLVENT									
24	USED RAGS							80		
	TOTAL	0	0	0	0	0	350	506	0	646

TABLE J.1

**NAVAIR SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	AIID230901	AIID239902	AIID239903	AIID999901	AOID020701	AOID050001	AOID220001	AOID230001	HOID050001
WS	HAZARDOUS WASTE									
01	ABRASIVE BLAST RESIDUE									
02	WASTE BATTERY								20	
03	WASTE BATTERY ACID								28	
04	WASTE CHEMICAL PAINT STRIPPER									
09	DRAINED FUEL			3,920						
10	WASTE ANTIFREEZE		1,550	600						
11	CONTAMINATED OIL		1,800							
13	WASTE MACHINE COOLANT									
14	METAL SHAVINGS/RESIDUE									
15	WASTE NDI FLUID									
16	WASTE PAINT REMNANT						19			
17	WASTE PAINT/CLEANUP SOLVENT									381
20	WASTE FIXER/DEVELOPER									
21	WASTE CLEANING SOLVENT					64				
24	USED RAGS						17	104		1,500
25	USED FILTERS						100			
	TOTAL	0	3,350	4,520	0	64	136	104	48	1,881
WS	WASTEWATER									
33	WASTEWATER-AIRCRAFT/VEHICLE CLEANING		7,336							
38	WASTEWATER-OTHER RINSING OPERATIONS									
	TOTAL	0	7,336	0	0	0	0	0	0	0
WS	AIR EMISSION									
43	FUGITIVE-VOC EMISSION	163	661	731		2	256	60	671	676
44	FUGITIVE-OTHER EMISSION									

TABLE J.1

**NAVAIR SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	AIID230901	AIID239902	AIID239903	AIID999901	AOID020701	AOID050001	AOID220001	AOID230001	HOID050001
	TOTAL	163	661	731	0	2	256	60	671	676
WS	NON-HAZARDOUS WASTE									
24	USED RAGS								65	
	TOTAL	0	0	0	0	0	0	0	65	0
WS	RECYCLED WASTE									
03	WASTE BATTERY ACID	22								
08	WASTE OIL/PNEUDRAULIC FLUID	73	5,808	2,000				426	222	
09	DRAINED FUEL		224							
21	WASTE CLEANING SOLVENT		62							
22	WASTE PETROLEUM-BASED SOLVENT									
24	USED RAGS		340	360						
	TOTAL	95	6,434	2,360	0	0	0	426	222	0

TABLE J.1

**NAVAIR SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	HOID050002	HOID230001	HOID230002	HOID230003	HOML020001
WS	HAZARDOUS WASTE					
01	ABRASIVE BLAST RESIDUE					
02	WASTE BATTERY					
03	WASTE BATTERY ACID					
04	WASTE CHEMICAL PAINT STRIPPER					
09	DRAINED FUEL					2,800
10	WASTE ANTIFREEZE					
11	CONTAMINATED OIL		1,600			205
13	WASTE MACHINE COOLANT					
14	METAL SHAVINGS/RESIDUE					
15	WASTE NDI FLUID					
16	WASTE PAINT REMNANT	62				
17	WASTE PAINT/CLEANUP SOLVENT	1,519				
20	WASTE FIXER/DEVELOPER					
21	WASTE CLEANING SOLVENT					
24	USED RAGS	798	340			
25	USED FILTERS				275	
	TOTAL	2,379	1,940	0	275	3,005
WS	WASTEWATER					
33	WASTEWATER-AIRCRAFT/VEHICLE CLEANING					54,570
38	WASTEWATER-OTHER RINSING OPERATIONS				8,377	
	TOTAL	0	0	0	8,377	54,570
WS	AIR EMISSION					
43	FUGITIVE-VOC EMISSION	5,613	417		4	100
44	FUGITIVE-OTHER EMISSION					

TABLE J.1

**NAVAIR SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	HOID050002	HOID230001	HOID230002	HOID230003	HOML020001
	TOTAL	5,613	417	0	4	100
WS	NON-HAZARDOUS WASTE					
24	USED RAGS		296	384	52	104
	TOTAL	0	296	384	52	104
WS	RECYCLED WASTE					
03	WASTE BATTERY ACID					
08	WASTE OIL/PNEUDRAULIC FLUID			1,633	149	
09	DRAINED FUEL					
21	WASTE CLEANING SOLVENT					
22	WASTE PETROLEUM-BASED SOLVENT					
24	USED RAGS					
	TOTAL	0	0	1,633	149	0

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	CBCN010001	CBID020701	CBID050501	CBID111301	CBML010501	CBSR020001	CBSR110001	DEMD020001	EOML010001
WS	HAZARDOUS WASTE									
01	ABRASIVE BLAST RESIDUE									
02	WASTE BATTERY					40				
03	WASTE BATTERY ACID									10
08	WASTE OIL/PNEUDRAULIC FLUID									
10	WASTE ANTIFREEZE						948			
16	WASTE PAINT REMNANT	75							75	
17	WASTE PAINT/CLEANUP SOLVENT									8
20	WASTE FIXER/DEVELOPER								489	
21	WASTE CLEANING SOLVENT									
22	WASTE PETROLEUM-BASED SOLVENT									
24	USED RAGS									
25	USED FILTERS									
43	FUGITIVE-VOC EMISSION									
53	EMPTY CONTAINER W/ RESIDUE								45	
55	LIGHT BULBS							375		
62	EXPIRED SHELF LIFE MATERIAL									
63	UNUSED HAZARDOUS MATERIAL									75
67	CHROMIC ACID BATH									
	TOTAL	75	0	0	0	40	948	375	609	93

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	CBCN010001	CBID020701	CBID050501	CBID111301	CBML010501	CBSR020001	CBSR110001	DEMD020001	EOML010001
WS	WASTEWATER									
08	WASTE OIL/PNEUDRAULIC FLUID									
09	DRAINED FUEL									
21	WASTE CLEANING SOLVENT									
22	WASTE PETROLEUM-BASED SOLVENT									
38	WASTEWATER-OTHER RINSING OPERATIONS									
39	WASTE COOLING WATER									
40	OTHER WASTEWATER						43,565			
	TOTAL	0	0	0	0	0	43,565	0	0	0
WS	AIR EMISSION									
43	FUGITIVE-VOC EMISSION	451	46	278	3	8	146	58		281
44	FUGITIVE-OTHER EMISSION									
	TOTAL	451	46	278	3	8	146	58	0	281
WS	NON-HAZARDOUS WASTE									
08	WASTE OIL/PNEUDRAULIC FLUID									
14	METAL SHAVINGS/RESIDUE				2					
16	WASTE PAINT REMNANT	20		44						
17	WASTE PAINT/CLEANUP SOLVENT			91						
24	USED RAGS	28		51		16	85	20		
25	USED FILTERS						158			
51	CEMENT/CONCRETE SEALING COMPOUND									
	TOTAL	48	0	186	2	16	243	20	0	0
WS	RECYCLED WASTE									
02	WASTE BATTERY						120			

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	CBCN010001	CBID020701	CBID050501	CBID111301	CBML010501	CBSR020001	CBSR110001	DEMD020001	EOML010001
03	WASTE BATTERY ACID						53			
08	WASTE OIL/PNEUDRAULIC FLUID						2,307			
10	WASTE ANTIFREEZE									
14	METAL SHAVINGS/RESIDUE									
22	WASTE PETROLEUM-BASED SOLVENT		410							
24	USED RAGS									
25	USED FILTERS									
53	EMPTY CONTAINER W/ RESIDUE									
58	REFRIGERANT									
59	SILVER-CONTAINING PAPER									
	TOTAL	0	410	0	0	0	2,480	0	0	0

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	HSID010401	HSID020701	HSID050501	HSID050701	HSID100001	HSID160001	HSID239901	HSSR019901	HSSR999901
WS	HAZARDOUS WASTE									
01	ABRASIVE BLAST RESIDUE	24								
02	WASTE BATTERY									
03	WASTE BATTERY ACID									
08	WASTE OIL/PNEUDRAULIC FLUID									142
10	WASTE ANTIFREEZE									
16	WASTE PAINT REMNANT			256	17					
17	WASTE PAINT/CLEANUP SOLVENT			600	36					
20	WASTE FIXER/DEVELOPER									
21	WASTE CLEANING SOLVENT									
22	WASTE PETROLEUM-BASED SOLVENT		64							
24	USED RAGS		100	203	30					
25	USED FILTERS			155						10
43	FUGITIVE-VOC EMISSION									
53	EMPTY CONTAINER W/ RESIDUE									
55	LIGHT BULBS									
62	EXPIRED SHELF LIFE MATERIAL									
63	UNUSED HAZARDOUS MATERIAL									
67	CHROMIC ACID BATH									
	TOTAL	24	164	1,214	83	0	0	0	0	152

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	HSID010401	HSID020701	HSID050501	HSID050701	HSID100001	HSID160001	HSID239901	HSSR019901	HSSR999901
WS	WASTEWATER									
08	WASTE OIL/PNEUDRAULIC FLUID									
09	DRAINED FUEL									
21	WASTE CLEANING SOLVENT									
22	WASTE PETROLEUM-BASED SOLVENT									
38	WASTEWATER-OTHER RINSING OPERATIONS									
39	WASTE COOLING WATER									
40	OTHER WASTEWATER									
	TOTAL	0	0	0	0	0	0	0	0	0
WS	AIR EMISSION									
43	FUGITIVE-VOC EMISSION			901	75	2	23	58		
44	FUGITIVE-OTHER EMISSION	1	7							
	TOTAL	1	7	901	75	2	23	58	0	0
WS	NON-HAZARDOUS WASTE									
08	WASTE OIL/PNEUDRAULIC FLUID									
14	METAL SHAVINGS/RESIDUE									
16	WASTE PAINT REMNANT									
17	WASTE PAINT/CLEANUP SOLVENT									
24	USED RAGS							150		100
25	USED FILTERS									
51	CEMENT/CONCRETE SEALING COMPOUND						20			
	TOTAL	0	0	0	0	0	20	150	0	100
WS	RECYCLED WASTE									
02	WASTE BATTERY								1,774	

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	HSID010401	HSID020701	HSID050501	HSID050701	HSID100001	HSID160001	HSID239901	HSSR019901	HSSR999901
03	WASTE BATTERY ACID									
08	WASTE OIL/PNEUDRAULIC FLUID									
10	WASTE ANTIFREEZE									
14	METAL SHAVINGS/RESIDUE					100				
22	WASTE PETROLEUM-BASED SOLVENT									
24	USED RAGS					5				
25	USED FILTERS									
53	EMPTY CONTAINER W/ RESIDUE									
58	REFRIGERANT									
59	SILVER-CONTAINING PAPER									
	TOTAL	0	0	0	0	105	0	0	1,774	0

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	HSSR999902	HTID050501	HTID050502	HTID220001	HTID230001	HTID230002	HTSR069901	MAID021001	MAID050001
WS	HAZARDOUS WASTE									
01	ABRASIVE BLAST RESIDUE									
02	WASTE BATTERY									
03	WASTE BATTERY ACID									
08	WASTE OIL/PNEUDRAULIC FLUID									
10	WASTE ANTIFREEZE	2,065				172				
16	WASTE PAINT REMNANT		37	458						
17	WASTE PAINT/CLEANUP SOLVENT		222							1,125
20	WASTE FIXER/DEVELOPER									
21	WASTE CLEANING SOLVENT			128						
22	WASTE PETROLEUM-BASED SOLVENT									
24	USED RAGS		481	6	40	75	60			
25	USED FILTERS						176			55
43	FUGITIVE-VOC EMISSION									
53	EMPTY CONTAINER W/ RESIDUE							32		
55	LIGHT BULBS									
62	EXPIRED SHELF LIFE MATERIAL									
63	UNUSED HAZARDOUS MATERIAL									
67	CHROMIC ACID BATH									
	TOTAL	2,065	740	592	40	247	236	32	0	1,180

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	HSSR999902	HTID050501	HTID050502	HTID220001	HTID230001	HTID230002	HTSR069901	MAID021001	MAID050001
WS	WASTEWATER									
08	WASTE OIL/PNEUDRAULIC FLUID						1,704			
09	DRAINED FUEL						2,240			
21	WASTE CLEANING SOLVENT						80			
22	WASTE PETROLEUM-BASED SOLVENT						192			
38	WASTEWATER-OTHER RINSING OPERATIONS									
39	WASTE COOLING WATER						5,219			
40	OTHER WASTEWATER						17			
	TOTAL	0	0	0	0	0	9,452	0	0	0
WS	AIR EMISSION									
43	FUGITIVE-VOC EMISSION	123	702	2,416	901	23	185	305	42	468
44	FUGITIVE-OTHER EMISSION									
	TOTAL	123	702	2,416	901	23	185	305	42	468
WS	NON-HAZARDOUS WASTE									
08	WASTE OIL/PNEUDRAULIC FLUID							50		
14	METAL SHAVINGS/RESIDUE									
16	WASTE PAINT REMNANT						120			
17	WASTE PAINT/CLEANUP SOLVENT									
24	USED RAGS	2,800					240			
25	USED FILTERS	300					220			
51	CEMENT/CONCRETE SEALING COMPOUND									
	TOTAL	3,100	0	0	0	0	580	50	0	0
WS	RECYCLED WASTE									
02	WASTE BATTERY				16					

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	HSSR999902	HTID050501	HTID050502	HTID220001	HTID230001	HTID230002	HTSR069901	MAID021001	MAID050001
03	WASTE BATTERY ACID									
08	WASTE OIL/PNEUDRAULIC FLUID	2,556								
10	WASTE ANTIFREEZE									
14	METAL SHAVINGS/RESIDUE									
22	WASTE PETROLEUM-BASED SOLVENT								2,304	
24	USED RAGS									
25	USED FILTERS									
53	EMPTY CONTAINER W/ RESIDUE									
58	REFRIGERANT									
59	SILVER-CONTAINING PAPER									
	TOTAL	2,556	0	0	16	0	0	0	2,304	0

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	MASR020001	MEID140601	MEMD010001	MMID050501	MMSR040001	MSSR099901	MVID021001	MVSR020002	MVSR040001
WS	HAZARDOUS WASTE									
01	ABRASIVE BLAST RESIDUE									
02	WASTE BATTERY									
03	WASTE BATTERY ACID									
08	WASTE OIL/PNEUDRAULIC FLUID									
10	WASTE ANTIFREEZE	2,640								
16	WASTE PAINT REMNANT									
17	WASTE PAINT/CLEANUP SOLVENT				45					
20	WASTE FIXER/DEVELOPER		1,291							
21	WASTE CLEANING SOLVENT									
22	WASTE PETROLEUM-BASED SOLVENT									
24	USED RAGS			5	47					
25	USED FILTERS									
43	FUGITIVE-VOC EMISSION									
53	EMPTY CONTAINER W/ RESIDUE									
55	LIGHT BULBS									
62	EXPIRED SHELF LIFE MATERIAL									
63	UNUSED HAZARDOUS MATERIAL									
67	CHROMIC ACID BATH			20,000						
	TOTAL	2,640	1,291	20,005	92	0	0	0	0	0

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	MASR020001	MEID140601	MEMD010001	MMID050501	MMSR040001	MSSR099901	MVID021001	MVSR020002	MVSR040001
WS	WASTEWATER									
08	WASTE OIL/PNEUDRAULIC FLUID									
09	DRAINED FUEL									
21	WASTE CLEANING SOLVENT									
22	WASTE PETROLEUM-BASED SOLVENT									
38	WASTEWATER-OTHER RINSING OPERATIONS					120				3,206
39	WASTE COOLING WATER									
40	OTHER WASTEWATER	24,900					1,100,800			
	TOTAL	24,900	0	0	0	120	1,100,800	0	0	3,206
WS	AIR EMISSION									
43	FUGITIVE-VOC EMISSION			5	62	6	2,459	7	438	145
44	FUGITIVE-OTHER EMISSION									
	TOTAL	0	0	5	62	6	2,459	7	438	145
WS	NON-HAZARDOUS WASTE									
08	WASTE OIL/PNEUDRAULIC FLUID									
14	METAL SHAVINGS/RESIDUE									
16	WASTE PAINT REMNANT									
17	WASTE PAINT/CLEANUP SOLVENT									
24	USED RAGS	120							240	467
25	USED FILTERS	5,000							90	
51	CEMENT/CONCRETE SEALING COMPOUND									
	TOTAL	5,120	0	0	0	0	0	0	330	467
WS	RECYCLED WASTE									
02	WASTE BATTERY								1,000	

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	MASR020001	MEID140601	MEMD010001	MMID050501	MMSR040001	MSSR099901	MVID021001	MVSR020002	MVSR040001
03	WASTE BATTERY ACID									
08	WASTE OIL/PNEUDRAULIC FLUID	86,620							1,436	
10	WASTE ANTIFREEZE								933	
14	METAL SHAVINGS/RESIDUE									
22	WASTE PETROLEUM-BASED SOLVENT							384		
24	USED RAGS									
25	USED FILTERS									
53	EMPTY CONTAINER W/ RESIDUE						300			
58	REFRIGERANT									
59	SILVER-CONTAINING PAPER		1,533							
	TOTAL	86,620	1,533	0	0	0	300	384	3,369	0

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	NEID020701	NESR020001	PMID230801	PMSR040201	PMSR049901	PMSR099901	PVID021001	PVSR020001	SEID050001
WS	HAZARDOUS WASTE									
01	ABRASIVE BLAST RESIDUE									
02	WASTE BATTERY		1,000							
03	WASTE BATTERY ACID									
08	WASTE OIL/PNEUDRAULIC FLUID									
10	WASTE ANTIFREEZE									
16	WASTE PAINT REMNANT									
17	WASTE PAINT/CLEANUP SOLVENT						23			11
20	WASTE FIXER/DEVELOPER									
21	WASTE CLEANING SOLVENT									
22	WASTE PETROLEUM-BASED SOLVENT									
24	USED RAGS				58	178				123
25	USED FILTERS									
43	FUGITIVE-VOC EMISSION									
53	EMPTY CONTAINER W/ RESIDUE									
55	LIGHT BULBS									
62	EXPIRED SHELF LIFE MATERIAL									
63	UNUSED HAZARDOUS MATERIAL									
67	CHROMIC ACID BATH									
	TOTAL	0	1,000	0	58	178	23	0	0	134

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	NEID020701	NESR020001	PMID230801	PMSR040201	PMSR049901	PMSR099901	PVID021001	PVSR020001	SEID050001
WS	WASTEWATER									
08	WASTE OIL/PNEUDRAULIC FLUID									
09	DRAINED FUEL									
21	WASTE CLEANING SOLVENT									
22	WASTE PETROLEUM-BASED SOLVENT									
38	WASTEWATER-OTHER RINSING OPERATIONS									
39	WASTE COOLING WATER									
40	OTHER WASTEWATER									
	TOTAL	0	0	0	0	0	0	0	0	0
WS	AIR EMISSION									
43	FUGITIVE-VOC EMISSION	16	36	563	1,702	74	591	166	4,887	234
44	FUGITIVE-OTHER EMISSION									
	TOTAL	16	36	563	1,702	74	591	166	4,887	234
WS	NON-HAZARDOUS WASTE									
08	WASTE OIL/PNEUDRAULIC FLUID									
14	METAL SHAVINGS/RESIDUE									
16	WASTE PAINT REMNANT									
17	WASTE PAINT/CLEANUP SOLVENT									
24	USED RAGS		273	220						
25	USED FILTERS								1,042	
51	CEMENT/CONCRETE SEALING COMPOUND									
	TOTAL	0	273	220	0	0	0	0	1,042	0
WS	RECYCLED WASTE									
02	WASTE BATTERY								1,520	

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	NEID020701	NESR020001	PMID230801	PMSR040201	PMSR049901	PMSR099901	PVID021001	PVSR020001	SEID050001
03	WASTE BATTERY ACID									
08	WASTE OIL/PNEUDRAULIC FLUID		8,315	105			73		5,798	
10	WASTE ANTIFREEZE								3,786	
14	METAL SHAVINGS/RESIDUE									
22	WASTE PETROLEUM-BASED SOLVENT	850						9,216	147	
24	USED RAGS	121							1,648	
25	USED FILTERS		1,750							
53	EMPTY CONTAINER W/ RESIDUE									
58	REFRIGERANT				7					
59	SILVER-CONTAINING PAPER									
	TOTAL	971	10,065	105	7	0	73	9,216	12,899	0

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SEML010501	WPML010501	WPML019901
WS	HAZARDOUS WASTE			
01	ABRASIVE BLAST RESIDUE			
02	WASTE BATTERY			
03	WASTE BATTERY ACID			
08	WASTE OIL/PNEUDRAULIC FLUID			
10	WASTE ANTIFREEZE			
16	WASTE PAINT REMNANT			
17	WASTE PAINT/CLEANUP SOLVENT			15
20	WASTE FIXER/DEVELOPER			
21	WASTE CLEANING SOLVENT			
22	WASTE PETROLEUM-BASED SOLVENT			
24	USED RAGS	150		
25	USED FILTERS			
43	FUGITIVE-VOC EMISSION		600	
53	EMPTY CONTAINER W/ RESIDUE			
55	LIGHT BULBS			
62	EXPIRED SHELF LIFE MATERIAL			75
63	UNUSED HAZARDOUS MATERIAL			
67	CHROMIC ACID BATH			
	TOTAL	150	600	90

TABLE J.2

**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SEML010501	WPML010501	WPML019901
WS	WASTEWATER			
08	WASTE OIL/PNEUDRAULIC FLUID			
09	DRAINED FUEL			
21	WASTE CLEANING SOLVENT			
22	WASTE PETROLEUM-BASED SOLVENT			
38	WASTEWATER-OTHER RINSING OPERATIONS			
39	WASTE COOLING WATER			
40	OTHER WASTEWATER			
	TOTAL	0	0	0
WS	AIR EMISSION			
43	FUGITIVE-VOC EMISSION	4		200
44	FUGITIVE-OTHER EMISSION			
	TOTAL	4	0	200
WS	NON-HAZARDOUS WASTE			
08	WASTE OIL/PNEUDRAULIC FLUID			
14	METAL SHAVINGS/RESIDUE			
16	WASTE PAINT REMNANT			
17	WASTE PAINT/CLEANUP SOLVENT			
24	USED RAGS		20	
25	USED FILTERS			
51	CEMENT/CONCRETE SEALING COMPOUND			
	TOTAL	0	20	0
WS	RECYCLED WASTE			
02	WASTE BATTERY			

TABLE J.2**NAVFAC SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SEML010501	WPML010501	WPML019901
03	WASTE BATTERY ACID			
08	WASTE OIL/PNEUDRAULIC FLUID			
10	WASTE ANTIFREEZE			
14	METAL SHAVINGS/RESIDUE			
22	WASTE PETROLEUM-BASED SOLVENT			
24	USED RAGS			
25	USED FILTERS			
53	EMPTY CONTAINER W/ RESIDUE			
58	REFRIGERANT			
59	SILVER-CONTAINING PAPER			
	TOTAL	0	0	0

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	AMID010203	AMID010302	AMID020605	AMID140304	AMID239908	NFID020701	NFID140303	SIID010201	SIID010213	SIID010231	SIID010233
WS	HAZARDOUS WASTE											
01	ABRASIVE BLAST RESIDUE	594	356						1,475	50	50	195
02	WASTE BATTERY											
06	PLATING BATH SLUDGE											
10	WASTE ANTIFREEZE											
13	WASTE MACHINE COOLANT											
15	WASTE NDI FLUID											
16	WASTE PAINT REMNANT											
17	WASTE PAINT/CLEANUP SOLVENT											
21	WASTE CLEANING SOLVENT											
22	WASTE PETROLEUM-BASED SOLVENT											
23	WASTE AQUEOUS-BASED CLEANER											
24	USED RAGS			291	360			92				
25	USED FILTERS											
30	LABORATORY TESTING CHEMICALS											
35	WASTEWATER-ELECTROPLATING BATH											
43	FUGITIVE-VOC EMISSION											
44	FUGITIVE-OTHER EMISSION										1	
53	EMPTY CONTAINER W/ RESIDUE											
63	UNUSED HAZARDOUS MATERIAL											
64	WASTE STOPBATH SOLUTION											
	TOTAL	594	356	291	360	0	0	92	1,475	50	51	195

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	AMID010203	AMID010302	AMID020605	AMID140304	AMID239908	NFID020701	NFID140303	SIID010201	SIID010213	SIID010231	SIID010233
WS	WASTEWATER											
18	WATER WALL PAINT BOOTH SLUDGE											
33	WASTEWATER-AIRCRAFT/VEHICLE CLEANING											
36	WASTEWATER-PHOTOGRAPHY SHOP											
37	WASTEWATER-NDI SHOP											
38	WASTEWATER-OTHER RINSING OPERATIONS											
40	OTHER WASTEWATER											
	TOTAL	0	0	0	0	0	0	0	0	0	0	0
WS	AIR EMISSION											
41	STACK-VOC EMISSION											
43	FUGITIVE-VOC EMISSION			897	291	67	117	168				
44	FUGITIVE-OTHER EMISSION	6	4						15	1		2
	TOTAL	6	4	897	291	67	117	168	15	1	0	2
WS	NON-HAZARDOUS WASTE											
24	USED RAGS											
	TOTAL	0	0	0	0	0	0	0	0	0	0	0

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	AMID010203	AMID010302	AMID020605	AMID140304	AMID239908	NFID020701	NFID140303	SIID010201	SIID010213	SIID010231	SIID010233
WS	RECYCLED WASTE											
02	WASTE BATTERY											
08	WASTE OIL/PNEUDRAULIC FLUID											
14	METAL SHAVINGS/RESIDUE											
21	WASTE CLEANING SOLVENT											
22	WASTE PETROLEUM-BASED SOLVENT						461					
24	USED RAGS											
	TOTAL	0	0	0	0	0	461	0	0	0	0	0

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID010301	SIID010302	SIID010303	SIID010401	SIID020401	SIID020616	SIID020627	SIID020636	SIID020701	SIID020714	SIID020724
WS	HAZARDOUS WASTE											
01	ABRASIVE BLAST RESIDUE	495	150	350	1,200							
02	WASTE BATTERY											
06	PLATING BATH SLUDGE											
10	WASTE ANTIFREEZE											
13	WASTE MACHINE COOLANT											
15	WASTE NDI FLUID											
16	WASTE PAINT REMNANT											
17	WASTE PAINT/CLEANUP SOLVENT											
21	WASTE CLEANING SOLVENT											58
22	WASTE PETROLEUM-BASED SOLVENT											
23	WASTE AQUEOUS-BASED CLEANER											
24	USED RAGS						20		12			
25	USED FILTERS		7									
30	LABORATORY TESTING CHEMICALS											
35	WASTEWATER-ELECTROPLATING BATH											
43	FUGITIVE-VOC EMISSION											
44	FUGITIVE-OTHER EMISSION											
53	EMPTY CONTAINER W/ RESIDUE											
63	UNUSED HAZARDOUS MATERIAL											
64	WASTE STOPBATH SOLUTION											
	TOTAL	495	157	350	1,200	0	20	0	12	0	0	58

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID010301	SIID010302	SIID010303	SIID010401	SIID020401	SIID020616	SIID020627	SIID020636	SIID020701	SIID020714	SIID020724
WS	WASTEWATER											
18	WATER WALL PAINT BOOTH SLUDGE											
33	WASTEWATER-AIRCRAFT/VEHICLE CLEANING											
36	WASTEWATER-PHOTOGRAPHY SHOP											
37	WASTEWATER-NDI SHOP											
38	WASTEWATER-OTHER RINSING OPERATIONS					258,960						
40	OTHER WASTEWATER											
	TOTAL	0	0	0	0	258,960	0	0	0	0	0	0
WS	AIR EMISSION											
41	STACK-VOC EMISSION			4								
43	FUGITIVE-VOC EMISSION						37	38	132	42	78	50
44	FUGITIVE-OTHER EMISSION	5	2		12							
	TOTAL	5	2	4	12	0	37	38	132	42	78	50
WS	NON-HAZARDOUS WASTE											
24	USED RAGS											
	TOTAL	0	0	0	0	0	0	0	0	0	0	0

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID010301	SIID010302	SIID010303	SIID010401	SIID020401	SIID020616	SIID020627	SIID020636	SIID020701	SIID020714	SIID020724
WS	RECYCLED WASTE											
02	WASTE BATTERY											
08	WASTE OIL/PNEUDRAULIC FLUID											
14	METAL SHAVINGS/RESIDUE											
21	WASTE CLEANING SOLVENT							38				
22	WASTE PETROLEUM-BASED SOLVENT									2,304	576	
24	USED RAGS											
	TOTAL	0	0	0	0	0	0	38	0	2,304	576	0

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID020725	SIID020726	SIID029937	SIID029938	SIID040129	SIID050101	SIID050102	SIID050701	SIID050702	SIID050715	SIID060101
WS	HAZARDOUS WASTE											
01	ABRASIVE BLAST RESIDUE											
02	WASTE BATTERY											
06	PLATING BATH SLUDGE											2,942
10	WASTE ANTIFREEZE											
13	WASTE MACHINE COOLANT											
15	WASTE NDI FLUID											
16	WASTE PAINT REMNANT						19					
17	WASTE PAINT/CLEANUP SOLVENT						52	1,933				
21	WASTE CLEANING SOLVENT											
22	WASTE PETROLEUM-BASED SOLVENT											
23	WASTE AQUEOUS-BASED CLEANER		935									
24	USED RAGS			12	12	151	23			30	32	
25	USED FILTERS							150	47		35	
30	LABORATORY TESTING CHEMICALS											
35	WASTEWATER-ELECTROPLATING BATH					607						
43	FUGITIVE-VOC EMISSION			8								
44	FUGITIVE-OTHER EMISSION											
53	EMPTY CONTAINER W/ RESIDUE											
63	UNUSED HAZARDOUS MATERIAL											
64	WASTE STOPBATH SOLUTION											
	TOTAL	0	935	20	12	758	94	2,083	47	30	67	2,942

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID020725	SIID020726	SIID029937	SIID029938	SIID040129	SIID050101	SIID050102	SIID050701	SIID050702	SIID050715	SIID060101
WS	WASTEWATER											
18	WATER WALL PAINT BOOTH SLUDGE											
33	WASTEWATER-AIRCRAFT/VEHICLE CLEANING											
36	WASTEWATER-PHOTOGRAPHY SHOP											
37	WASTEWATER-NDI SHOP											
38	WASTEWATER-OTHER RINSING OPERATIONS											
40	OTHER WASTEWATER											
	TOTAL	0	0	0	0	0	0	0	0	0	0	0
WS	AIR EMISSION											
41	STACK-VOC EMISSION											
43	FUGITIVE-VOC EMISSION	1,609	45		8		152	4,465	172	35	141	2,116
44	FUGITIVE-OTHER EMISSION					94						
	TOTAL	1,609	45	0	8	94	152	4,465	172	35	141	2,116
WS	NON-HAZARDOUS WASTE											
24	USED RAGS											
	TOTAL	0	0	0	0	0	0	0	0	0	0	0

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID020725	SIID020726	SIID029937	SIID029938	SIID040129	SIID050101	SIID050102	SIID050701	SIID050702	SIID050715	SIID060101
WS	RECYCLED WASTE											
02	WASTE BATTERY											
08	WASTE OIL/PNEUDRAULIC FLUID											
14	METAL SHAVINGS/RESIDUE											
21	WASTE CLEANING SOLVENT											
22	WASTE PETROLEUM-BASED SOLVENT	10,752										
24	USED RAGS							1,518				
	TOTAL	10,752	0	0	0	0	0	1,518	0	0	0	0

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID060402	SIID100028	SIID100117	SIID140301	SIID140601	SIID170632	SIID170634	SIID190001	SIID201220	SIID201319	SIID209921
WS	HAZARDOUS WASTE											
01	ABRASIVE BLAST RESIDUE											
02	WASTE BATTERY											
06	PLATING BATH SLUDGE											
10	WASTE ANTIFREEZE											
13	WASTE MACHINE COOLANT		1,474	88								
15	WASTE NDI FLUID					272						
16	WASTE PAINT REMNANT	30								60	60	
17	WASTE PAINT/CLEANUP SOLVENT										16	
21	WASTE CLEANING SOLVENT											
22	WASTE PETROLEUM-BASED SOLVENT									15		
23	WASTE AQUEOUS-BASED CLEANER											
24	USED RAGS				12							
25	USED FILTERS											
30	LABORATORY TESTING CHEMICALS											
35	WASTEWATER-ELECTROPLATING BATH											
43	FUGITIVE-VOC EMISSION											
44	FUGITIVE-OTHER EMISSION											
53	EMPTY CONTAINER W/ RESIDUE											4
63	UNUSED HAZARDOUS MATERIAL						468	18				
64	WASTE STOPBATH SOLUTION											
	TOTAL	30	1,474	88	12	272	468	18	0	75	76	4

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID060402	SIID100028	SIID100117	SIID140301	SIID140601	SIID170632	SIID170634	SIID190001	SIID201220	SIID201319	SIID209921
WS	WASTEWATER											
18	WATER WALL PAINT BOOTH SLUDGE	57,024										
33	WASTEWATER-AIRCRAFT/VEHICLE CLEANING											
36	WASTEWATER-PHOTOGRAPHY SHOP											
37	WASTEWATER-NDI SHOP					7						
38	WASTEWATER-OTHER RINSING OPERATIONS											
40	OTHER WASTEWATER											
	TOTAL	57,024	0	0	0	7	0	0	0	0	0	0
WS	AIR EMISSION											
41	STACK-VOC EMISSION											
43	FUGITIVE-VOC EMISSION		49		225	16			384	119	497	13
44	FUGITIVE-OTHER EMISSION											
	TOTAL	0	49	0	225	16	0	0	384	119	497	13
WS	NON-HAZARDOUS WASTE											
24	USED RAGS								10			
	TOTAL	0	0	0	0	0	0	0	10	0	0	0

TABLE J.3**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID060402	SIID100028	SIID100117	SIID140301	SIID140601	SIID170632	SIID170634	SIID190001	SIID201220	SIID201319	SIID209921
WS	RECYCLED WASTE											
02	WASTE BATTERY											
08	WASTE OIL/PNEUDRAULIC FLUID			279								
14	METAL SHAVINGS/RESIDUE											
21	WASTE CLEANING SOLVENT											
22	WASTE PETROLEUM-BASED SOLVENT											
24	USED RAGS											
	TOTAL	0	0	279	0	0	0	0	0	0	0	0

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID220101	SIID220111	SIID229901	SIID230001	SIID230401	SIID230412	SIID230801	SIID239903	SIID239904	SIID239905	SIID239906
WS	HAZARDOUS WASTE											
01	ABRASIVE BLAST RESIDUE											
02	WASTE BATTERY			72								
06	PLATING BATH SLUDGE				86					413		429
10	WASTE ANTIFREEZE											
13	WASTE MACHINE COOLANT											
15	WASTE NDI FLUID											
16	WASTE PAINT REMNANT											
17	WASTE PAINT/CLEANUP SOLVENT											
21	WASTE CLEANING SOLVENT						62					
22	WASTE PETROLEUM-BASED SOLVENT				16							
23	WASTE AQUEOUS-BASED CLEANER											
24	USED RAGS		20									
25	USED FILTERS				20							25
30	LABORATORY TESTING CHEMICALS											
35	WASTEWATER-ELECTROPLATING BATH											
43	FUGITIVE-VOC EMISSION											
44	FUGITIVE-OTHER EMISSION											
53	EMPTY CONTAINER W/ RESIDUE											
63	UNUSED HAZARDOUS MATERIAL											
64	WASTE STOPBATH SOLUTION											
	TOTAL	0	20	72	122	0	62	0	0	413	0	454

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID220101	SIID220111	SIID229901	SIID230001	SIID230401	SIID230412	SIID230801	SIID239903	SIID239904	SIID239905	SIID239906
WS	WASTEWATER											
18	WATER WALL PAINT BOOTH SLUDGE											
33	WASTEWATER-AIRCRAFT/VEHICLE CLEANING				4,191							
36	WASTEWATER-PHOTOGRAPHY SHOP											
37	WASTEWATER-NDI SHOP											
38	WASTEWATER-OTHER RINSING OPERATIONS											
40	OTHER WASTEWATER										2,490	
	TOTAL	0	0	0	4,191	0	0	0	0	0	2,490	0
WS	AIR EMISSION											
41	STACK-VOC EMISSION											
43	FUGITIVE-VOC EMISSION	18	26		24		3	5		15		33
44	FUGITIVE-OTHER EMISSION											
	TOTAL	18	26	0	24	0	3	5	0	15	0	33
WS	NON-HAZARDOUS WASTE											
24	USED RAGS											
	TOTAL	0	0	0	0	0	0	0	0	0	0	0

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID220101	SIID220111	SIID229901	SIID230001	SIID230401	SIID230412	SIID230801	SIID239903	SIID239904	SIID239905	SIID239906
WS	RECYCLED WASTE											
02	WASTE BATTERY											120
08	WASTE OIL/PNEUDRAULIC FLUID				781				83	215		624
14	METAL SHAVINGS/RESIDUE											
21	WASTE CLEANING SOLVENT											
22	WASTE PETROLEUM-BASED SOLVENT											
24	USED RAGS				614				8	140		50
	TOTAL	0	0	0	1,395	0	0	0	91	355	0	794

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID240001	SIML010002	SIML010003	SIML019901	SIMS010201	SISR010001	SISR129930
WS	HAZARDOUS WASTE							
01	ABRASIVE BLAST RESIDUE							
02	WASTE BATTERY							
06	PLATING BATH SLUDGE							
10	WASTE ANTIFREEZE							
13	WASTE MACHINE COOLANT							
15	WASTE NDI FLUID							
16	WASTE PAINT REMNANT							
17	WASTE PAINT/CLEANUP SOLVENT							
21	WASTE CLEANING SOLVENT				2			
22	WASTE PETROLEUM-BASED SOLVENT							
23	WASTE AQUEOUS-BASED CLEANER							
24	USED RAGS							
25	USED FILTERS							
30	LABORATORY TESTING CHEMICALS	6,074						
35	WASTEWATER-ELECTROPLATING BATH							
43	FUGITIVE-VOC EMISSION							
44	FUGITIVE-OTHER EMISSION							
53	EMPTY CONTAINER W/ RESIDUE							
63	UNUSED HAZARDOUS MATERIAL				1			
64	WASTE STOPBATH SOLUTION							504
	TOTAL	6,074	0	0	3	0	0	504

TABLE J.3

**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID240001	SIML010002	SIML010003	SIML019901	SIMS010201	SISR010001	SISR129930
WS	WASTEWATER							
18	WATER WALL PAINT BOOTH SLUDGE							
33	WASTEWATER-AIRCRAFT/VEHICLE CLEANING							
36	WASTEWATER-PHOTOGRAPHY SHOP							43,764
37	WASTEWATER-NDI SHOP							
38	WASTEWATER-OTHER RINSING OPERATIONS							
40	OTHER WASTEWATER							
	TOTAL	0	0	0	0	0	0	43,764
WS	AIR EMISSION							
41	STACK-VOC EMISSION							
43	FUGITIVE-VOC EMISSION	2,032		82	11	85	4	
44	FUGITIVE-OTHER EMISSION							
	TOTAL	2,032	0	82	11	85	4	0
WS	NON-HAZARDOUS WASTE							
24	USED RAGS							
	TOTAL	0	0	0	0	0	0	0

TABLE J.3**NAVSEA SUMMARY OF WASTESTREAM FATE CALCULATIONS
NS MAYPORT, FL**

	DESCRIPTION	SIID240001	SIML010002	SIML010003	SIML019901	SIMS010201	SISR010001	SISR129930
WS	RECYCLED WASTE							
02	WASTE BATTERY							
08	WASTE OIL/PNEUDRAULIC FLUID							
14	METAL SHAVINGS/RESIDUE		36					
21	WASTE CLEANING SOLVENT							
22	WASTE PETROLEUM-BASED SOLVENT			1,520				
24	USED RAGS			250				
	TOTAL	0	36	1,770	0	0	0	0

APPENDIX K
SUMMARY OF TOXIC CHEMICALS USED/RELEASED

Appendix K provides names and quantities of toxic chemicals used and released, organized by process identification numbers. First column provides the process identification number followed by the names of toxic chemicals used by that process. The third and fourth columns provide individual quantity of toxic chemicals used and released by process sites. The fifth and sixth columns provide total toxic chemicals used and released by process sites.

APPENDIX L
TECHNICAL OPTIONS EVALUATIONS AND ECONOMIC ANALYSIS
WORKSHEETS

Appendix L provides completed work sheets 9-13 for technical feasibility evaluation and economic analysis. Back-up calculation sheets are also included. The worksheets are organized by seven general process groups: painting operations, fluid changeouts\lubrication operations, Degreasing\Cleaning Operations, Operations Using Adhesives\Sealants, Battery Operations, NDI\Photographic Operations, and Miscellaneous Operations.

APPENDIX M

PRIORITIZATION WORKSHEETS

Appendix M provides completed worksheets 14 for final prioritization of options. Worksheets are organized by the seven general process groups.